October, 1924

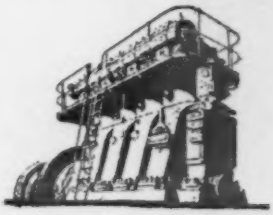
Airplane View of Boston, Its Harbor, the Charles River and Cambridge

Vol. XXXI No. 4
50 Cents $4 a Year

PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

The American City

$36,000 Profit —and improved service besides



The City of Crowley, La., has been manufacturing electricity for about 18 years, using several different types of prime movers. Up to the time that Fulton-Diesels were installed the plant had cost more to run than the revenue derived from customers, and service was both unreliable and insufficient.

In July, 1922, the present equipment of two Fulton-Diesels (380- and 285-b.h.p. units), was put into operation. The plant is now showing a profit of $3,000.00 per month—or a gain of over $36,000.00 per annum. In addition, consumer service is satisfactory in every way.

This profit is figured with all charges for interest depreciation (at 20 years), insurance, and a liberal allowance for repairs.

The Plant Superintendent states, "We bought Fulton-Diesel engines after a careful study of their construction, and feel that our decision has been the right one. We get excellent regulation and parallel operation. The Fulton Iron Works Company is a good company to deal with."

Fulton-Diesels are setting new low cost records in many lines of industry. Investigation may show you cases in which problems similar to yours were successfully overcome. Our staff of experienced Fulton-Diesel engineers will gladly consult with you, anywhere and at any time, without obligation. Write for booklet, carefully prepared and fully illustrated, describing the Fulton-Diesel in detail—free and postpaid.

The facts and figures given above were secured by an independent engineering organization, and are related just as furnished in their report.

FULTON IRON WORKS COMPANY, ST. LOUIS, U. S. A.

Successful engine builders for over seventy years

BRANCH OFFICES:

New York—82 Wall St.
New Orleans—Hibernia Bank Building
Dallas, Texas—Praetorian Building
Havana, Cuba—401-402-403 Banco Nacional

FULTON-DIESEL

VOL. XXXI No. 4 THE AMERICAN CITY, October, 1924 Price, 50 Cents; $4 a Year
Entered as second-class matter, July 29, 1910, at the Post Office at New York, N. Y., under Act of March 3, 1879
Issued Monthly by The Civic Press, 443 Fourth Ave., New York Printed in U. S. A

Vol. XXXI
No. 4

The American City Magazine

OCTOBER
1924

443 Fourth Ave.
NEW YORK

50 Cents
$4 a Year

A Code of Morals for Use in the Schools of America

A fine piece of public service is being rendered by "Collier's" in inviting suggestions for a Code of Morals suitable for use in the schools throughout the United States. As a contribution towards this discussion, THE AMERICAN CITY *suggests the form of pledge printed below; this to be made available in placard form for the walls of the school and the home, and to be supplemented by readings on the twenty-one points in a text-book to be compiled from the greatest recorded thoughts of all time, by a group of outstanding leaders of the religious, civic, and educational life of America.*

That I May Live an Upright, Useful and Happy Life

I will endeavor, to the best of my ability:

1.—To serve God and humanity with my heart and mind and strength;

2.—To honor my parents, and to be a credit to them at all times;

3.—To be a good citizen of my town, my state, my nation, and of the world;

4.—To seek for others, and not merely for myself, a happier and more abundant life;

5.—To be kind, courteous and unselfish;

6.—To be sympathetic with those who suffer, and more tolerant of the faults of others than of my own;

7.—To be clean, strong and alert, in mind and in body;

8.—To be honest, truthful and dependable;

9.—To be ambitious, but not envious;

10.—To be cheerful and hopeful, in thought and demeanor;

11.—To be self-reliant and courageous, but not vain or foolhardy;

12.—To control my tongue, my temper, and my appetites;

13.—To play fair in all the games and relationships of life;

14.—To help, by word and deed, the cause of peace and good-will among the nations of the world;

15.—To discover and uphold spiritual truth;

16.—To learn to know and enjoy the beauties of nature, of art and literature, and of human comradeship;

17.—To forego comfort or pleasure, when that shall be necessary, but not to be embittered;

18.—To fit myself for a congenial occupation whereby I may produce more that is of value to mankind than I consume;

19.—To use my time profitably, and my intelligence constructively;

20.—To seek frequent opportunities, through reading, contemplation or worship, to renew and increase my zeal for the finer things of life;

21.—To leave the world a better place for my having lived in it.

Requiring Owners or Tenants to Help in Fire Protection

TO provide the maximum of service by the city to its citizens without undue weakening of individual initiative and responsibility, is an ideal requiring constant study by every municipal government. A case in point is the problem of personal liability for fire protection in its relation to the increasing efficiency of municipal fire departments.

With the knowledge that a well-manned fire-fighting force with modern equipment can be summoned promptly by fire-alarm box or telephone, and that possible fire losses are largely covered by his insurance policies, the average citizen is apt to take an all too complacent attitude towards his responsibility in protecting his home or place of business from fire. If his complacency ever permits him to think about it at all, the citizen realizes that for an incipient blaze a fire extinguisher on the spot outclasses an engine at the fire house. He may even intend—when he gets around to it—to install some hand extinguishers in his home or place of business. But unless a local ordinance requires that this be done, his good intentions will usually extinguish themselves—and nothing else.

In any ordinance for the installation of fire extinguishers by owners or tenants, several factors need careful consideration. The ordinance should avoid specifying a particular make of extinguisher, and at the same time it should be drawn with the fact in mind that the purchaser will be apt to buy the cheapest extinguisher that he can find which answers to the legal requirement. It is not enough to specify that the extinguisher must be of a type approved by the Underwriters' Laboratories; the ordinance must recognize the fact that the Underwriters' Laboratories have differentiated very clearly between the several types of extinguishers as to their suitability for different kinds of fires, and that property owners must be protected against their own indifference to or ignorance of the technical points of fire protection engineering. The ordinary citizen can hardly be expected, for example, to understand the difference in efficiency and use between the various approved types of extinguishers, such as the soda-acid, foam, carbon tetrachloride and the calcium chloride types.

In addition to types of extinguishers, the ordinance, if properly drawn, will give consideration to the matter of size and to the number to be installed. While the 2½-gallon extinguisher is standard for factories and business buildings, a smaller size may be more practical for use in homes, schools or in any building where women and children are expected to operate extinguishers.

Other factors needing careful consideration include the proper hanging of the extinguishers, protection against freezing (or the use of non-freezing types), periodic cleaning and recharging, and instruction in their use. Simple though the operation of a fire extinguisher may be, the time to learn how to use the device is before the fire starts. Here, unquestionably, adequate preparedness is the price of safety.

Spread of the Two-Platoon Basis in Fire Departments—Cause and Effect

THE great demand for labor, with its increased pay and shorter working time, has resulted in practically all the larger cities and a great number of the smaller ones placing their fire departments on a two-platoon basis, with consequent increases in salaries. The influx of new men brought about by this change, and by vacancies caused by resignations, resulted in impairing rather seriously the efficiency of many fire departments. This has been recognized in most of the large cities, with the result that extensive systems of drills have been inaugurated, with adequately equipped drill towers.

A marked improvement along this line has been observed in a number of cities during the past year. The effect of military discipline and training on many of the young men in the fire departments is also noticeable. There are still some of the larger cities which have not adopted this modern method of drills and training, with the result that their departments are noticeably inefficient.

Another result of the adoption of the two-platoon system and the increase in salaries to hold the men, is the approximate doubling of the per capita maintenance cost. In some of the Western and Mid-Western States, notably Ohio, it has been impossible to establish a tax levy sufficient to maintain the fire department at this high per capita cost. This has resulted, in some cases, in materially decreasing the number of companies, or men assigned to the companies, with a corresponding decrease in the effectiveness of the department. The substitution of motor apparatus for horse-drawn has somewhat offset this condition. Doubtless there will be a tendency in the next few years to economize in municipal expenditures and this economy will probably include fire department operations. The two-platoon feature of organization, with the off-shift men subject to call, to a certain extent offsets the effect of a reduction in the force normally on duty.

—*Safeguarding America Against Fire*, July, 1924.

Snow Removal Methods in Manchester

By H. S. R. McCurdy

Surveyor, Department of Highways, Manchester, N. H.

NORTHERN New England is subject to snowfall conditions probably as severe as those in any part of this country. The storms are heavy and of frequent occurrence and the industrial nature of the communities renders any interference with traffic on the highways a serious and costly matter. In common with most other progressive cities, the traffic of Manchester is very largely motorized. The fire department is entirely so; and while some of the coal, wood and ice companies still use sleighs to a limited extent, this is principally owing to the fact that some of their hauling must be done in the rural sections.

A STREET IN MANCHESTER, N. H., AFTER PLOWING BY HEAVY TRACTOR PLOW

The theory is frequently advanced by those who desire to use runners that it is a practicable matter to leave some snow on the streets —that the streets can be plowed or scraped or cleaned in such a manner that a smooth surface is left for both sleighs and motors. This is not so. While a street so treated may be used for a limited time in cold weather by motor traffic, the action of the tire chains soon forms deep ruts, which are extremely dangerous. In fact, there have been ruts so deep on the streets of this city that cars were forced to go blocks beyond their street before being able to turn out. Furthermore, when such ruts extend through to the street surface the concentrated wear on the pavement is extremely destructive.

In view of all the circumstances affecting travel on the highways it is the policy in Manchester to keep the streets thoroughly clear of snow. This work comes under the Highway Department. City forces are used exclusively, except for the sidewalk plowing and in the case of a few teams used at odd times and places to cart off snow.

For snow removal from the streets three types of plows are used. The largest and most powerful unit is the Sargent tractor plow attached to a 10-ton Holt Caterpillar tractor. The combined outfit was purchased in February, 1923. The Sargent plow and Holt tractor are used for the heaviest work and for the hill streets. Traveling at the rate of about five miles per hour, the outfit will clear a maximum width of 28 feet and to date has not encountered any work too severe to handle. To secure adequate traction, however, it is necessary to equip the tractor with military grousers, which are nothing more nor less than cast iron cleats bolted to the treads.

SARGENT PLOW AND HOLT TRACTOR CLEANING SIDE STREET IN MANCHESTER, N. H.

The crew for the tractor plow consists of a driver for

the tractor and two men to operate the wings of the plow, the labor cost, at the rates paid in Manchester, amounting to $1.50 per hour. The outfit has gone through practically two winters with only nominal repairs.

For the more level streets four Champion blade plows are used. These plows are attached to the front of five-ton motor trucks and are extremely efficient for ordinary snowfalls on roads which are not too steep.

The third type of plow used is the Sargent truck plow, a V-shaped plow for use with motor trucks. This plow is of wooden construction and was found to be not quite stout enough for the work it was called upon to do. As a result, it was out of commission a considerable portion of the time and required considerable repairs. This company now puts out a stronger model of this plow which should be a marked improvement.

It is the policy of the Highway Department to get the jump on the snowstorms, and as soon as from 4 to 6 inches of snow has fallen the equipment is sent out. The blade plows are routed through the principal thoroughfares pushing the snow over into the gutters, making as many runs as are necessary to do this, depending upon the width of the street. The length of the blade is 10 feet, clearing a swath about 8 feet wide, depending somewhat upon the angle at which the blade is set. The plows are followed by small gangs of shovelers whose duty it is to open up the crosswalks where the plow furrow has crossed an intersection.

The tractor plow confines its operations chiefly to the steeper grades and to the trunk line highways leading out of the town. The city of Manchester covers an area of 34 square miles, with a population of about 80,000, and, as a result, there are many miles of more or less important thoroughfares in the sparsely-settled outlying districts. For these the tractor outfit is particularly adapted, as it possesses the power necessary to buck the drifts and can cover ground on practically any kind of roadway.

The Sargent truck plow is used principally on the residential streets where one run is sufficient, opening a road from 6 to 12 feet wide, depending upon the adjustment of the wings.

The relative merits of the various types of plows must be viewed from the point of local conditions. For ordinary city streets the blade plow is efficient and economical. It takes but a short time to attach and its first cost is comparatively low, so that with its use there is little capital tied up in plant lying idle the greater part of the year. The weak point of the combination is the truck. In order to increase the traction the truck body should be loaded and when this is done the combined hauling of the load and the strain of bucking the snow submits the truck to extremely severe usage. Then, again, its limited power restricts its use to the more level streets.

The tractor outfit is highly efficient and capable of handling the most severe conditions. But here is a piece of plant, costing at present-day prices about $8,000, whose use is confined to very short periods in a single season. It is true that the tractor can be used for a number of other purposes, but the need of these various uses must exist in order to bring down the large overhead otherwise charged to snow removal. In Manchester the tractor is used for heavy hauling and for dragging road machines, but even so there remains a first cost of $1,500 for the plow.

It is probable that for the lighter conditions of snowfall a five-ton tractor could be used to advantage, and where this is the case the money would be better spent in purchasing more of this type than in installing the heavier unit. Two five-ton machines, under proper conditions, will do twice the work of one ten-ton tractor and their use is well worth serious consideration. It is, however, poor policy to be underpowered and it is much more satisfactory to err on the side of having too much power than to have an outfit lie down on the job when most urgently needed.

In the principal business

PUSHER TYPE PLOW OPERATED BY 5-TON TRUCK CLEANING BUSINESS STREET IN MANCHESTER, N. H.

BARBER-GREENE LOADER REMOVING SNOW FROM PRINCIPAL STREET OF MANCHESTER

streets of Manchester the snow is removed after being plowed. In general the procedure is to plow the snow into the gutters and to load it into five-ton trucks by means of a Barber-Greene snow loader. This latter machine is one of the most efficient and altogether satisfactory pieces of plant that have been put on the market in recent years. With it the largest truck can be filled with snow in 15 or 20 seconds, when properly operated. The snow loader shoves into the windrow of snow, passing it up on an endless belt and dropping it into the truck body.

During the operation the truck backs along, closely following the loader. In some of the narrower streets snow is plowed from the sides to a row in the center of the street, where the loader picks it up on one run. Where the snow loader is operating in the gutters it is the practice to proceed against the traffic. In this manner the trucks follow the general direction of traffic in returning to the loader and in proceeding with their load. For the purpose of increasing the size of the load a truck body will hold, a hopper-shaped detachable top is placed on top of the regular truck body. In general, snow is dumped on the parks and commons, although provisions are made for dumping into one of the main outfall sewers and from two of the bridges.

The city of Manchester attempts to clean all of the sidewalks. For this purpose about 60 V-shaped wooden plows, drawn by single horses, are used. As this is strictly seasonal work, the city naturally does not maintain a sufficient number of horses available for the purpose and the plows are farmed out to various residents whose horses are not busy during the winter season. Each of these residents has a definite beat to cover and receives $4.00 per trip over the sidewalks in his district.

Waste from Leaky Spigots Piles Up Water Bills

HOW much householders must pay for waste of water from leaky fixtures is presented in a table by the Pennsylvania Public Service Information Committee. The figures were compiled in a town where the water rate is $1.50 a thousand cubic feet.

What the leaks cost the careless consumer or waster of water every three months is summarized as follows:

Size of Leak	Gal.	Cost
Steady drop, drop	2,160	$ .44
Very thin stream 1-32 inch (Small leak at faucet)	13,563	2.70
Thin stream 1-16 inch (Badly worn faucet washers)	54,243	10.85
Eighth-inch stream (Overflowing flush)	239,481	47.85
Quarter-inch stream (Small faucet left open)	957,933	191.60
Three-eighths inch (Large faucet left open)	2,241,000	448.20

Keeping the Country's Highways Open in Winter

Demise of Dobbin and Rise of Motor Truck Makes Snow Removal Imperative

REMOVAL of snow from the highways of the country is a matter of increasing importance each winter. Since 1906, the number of motor vehicles registered has increased from 48,000 to over fifteen million, while the mileage of surfaced road has increased from 150,000 miles to about 430,000 miles. Approximately 62 per cent of the motor vehicles are registered, and 53 per cent of the surfaced roads lie within the territory where the average annual snowfall is 20 or more inches.

The snow-clearing program of the states east of the Mississippi for the present winter includes 16,000 miles of main trunk line highway as compared with 13,000 miles for last winter, according to information collected by the Bureau of Public Roads of the U. S. Department of Agriculture. This amounts to about 30 per cent of the surfaced mileage in the states where snow is a problem, those north of the southern boundary of Virginia and Kentucky.

With the exception of a few small areas, the annual snowfall in this belt ranges from 20 to 130 inches, making the clearing of the above mileage an undertaking of considerable size. As indicating the size of the undertaking in various sections, the average annual snowfall ranges from 74 to 132 inches in Maine, from 25 to 92 inches in Pennsylvania, from 16 to 22 inches in Delaware, from 28 to 121 inches in Michigan, and from 9 to 101 inches in West Virginia. These figures taken from weather bureau records covering a period of years show that the problem of snow removal varies considerably in difficulty even in different parts of the same state. In nearly every state in the group the average maximum snowfall is more than twice as great as the average minimum snowfall, Delaware being the only conspicuous exception.

Snow is removed by state forces in Rhode Island, Connecticut, New Jersey, Pennsylvania, Maryland, Delaware, Virginia, Ohio, West Virginia, Illinois, and Indiana, and on one section of road in Minnesota. The work is left to counties, towns or other local units in New Hampshire, Vermont, Massachusetts, New York, Kentucky, Michigan, Wisconsin, and the greater part of Minnesota. In Michigan and Wisconsin the counties may be ordered by the State Highway Department to remove snow from state roads.

Pennsylvania, one of the pioneers in snow removal, may be taken as having an organization typical of those well organized for the work. The work is done by the State Highway Department with its regular maintenance forces and funds, the funds being derived from motor vehicle registration fees. The state is divided into four divisions, which are subdivided into 15 districts. Under the district engineers are 52 superintendents, 700 foremen, 6,300 laborers, 130 truck drivers, and 40 tractor operators. One hundred and sixty-seven trucks and 40 tractors are available, all of which are equipped with snow-plows, and also 300 road machines and drags. A garage and repair shop is located within the jurisdiction of each of the 52 superintendents. The equipment is kept in condition for instant use and the permanently organized maintenance force is ready to start work as soon as a few inches of snow has fallen. This organization has a program of 2,200 miles of primary roads to be cleared to an average width of 26 feet, and secondary roads to be cleared as far as practicable.

Representatives of the Federal Bureau who have visited all the states east of the Mississippi believe that state control of snow removal on the main trunk line roads is desirable in the interest of economy. Such work is easily coordinated with, and is really a part of, the maintenance of state roads.

Methods of snow removal vary considerably, but all states report that it is essential that work be started almost as soon as the snowfall begins and continued until the roads are cleared.

Pennsylvania, with an average fall of 48 inches, cleared 1,850 miles at a cost of $91,498, or $49 per mile. Connecticut, with an average fall of 73 inches, cleared 1,508 miles at a total cost of $175,022, or $111 per mile. Michigan, with an average fall of 74 inches, cleared 1,115 miles at a cost of $87,153, or $78 per mile, while Maryland, with an average fall of only 23 inches, cleared 2,000 miles at a cost of $20,000, or $10 per mile.

—*Michigan Roads and Pavements.*

Building Sand-Asphalt and Marl Roads in North Carolina

By W. F. Morson

District Engineer, Third District, North Carolina State Highway Commission

WITH the possible exception of Cumberland County, which borders on the Piedmont section of North Carolina, there is little if any native road-building material of the most common kind, such as gravel or stone, in the third district of the North Carolina State Highway System, with the exception of some marl rock deposits along the coast. Rather, the soil is of a rich agricultural nature, which is always poor quality for making roads, or else an abundance of sand with a scarcity of good clay for bonding purposes. Because of the scarcity of the more common road-building materials essential for even a dependable subgrade, it became imperative to adopt some type of pavement using local materials in many sections of the district where the cost of importing high-class material is prohibitive. This led to considerable prospecting and experimenting with such local material as was available.

VIEW OF THE PIT FROM WHICH THE MARL WAS OBTAINED

Sand-Asphalt Roads

One of the first special types tried out was the sand-asphalt which the state built with its own organization between Wilmington and Newbern, where there are miles of sand, much of which has the proper grading for sheet or sand asphalt. This is no longer an experiment, as the first pavement laid is over two years old and has proved so satisfactory, and its cheapness, as compared with other types of hard surface, has made it so popular, that it is now being laid on quite an extensive scale in many sections, particularly in the eastern part of the state, where there are ample deposits of sand with proper grading and good drainage and where the subgrade is of a sandy nature or can be made so at a minimum cost.

The sand-asphalt pavement consists of a base 3 inches in thickness, made up of 92 to 94 per cent sand and 8 to 6 per cent asphalt laid on a well-prepared subgrade which is generally and preferably sandy itself and confined with 2 x 8-inch wooden headers, either cypress or yellow pine, preferably the former when it can be obtained.

The top or wearing surface consists of 1½ inches of sheet asphalt. The most important requirements for success in this type of pavement, assuming, of course, that all the usual requirements for good sand or sheet asphalt are complied with, is that the subgrade be well drained and of a sandy

THE MARL-CRUSHING PLANT WITH INDUSTRIAL RAILWAY SERVING IT

nature, with the sand well confined with some suitable type of header.

The Development of Marl-Asphalt Pavement

One of the most interesting and valuable special types of pavement yet constructed in the Third District of North Carolina, is what has been locally named marl-asphalt. This type was not begun as such, but, like most special types, was the result of many changes in the original specifications made necessary by the difficulties met with in attempting to carry out the original contract, which called for an 8-inch water-bound macadam, after compaction, made with local marl rock.

The marl rock used is of a limestone shell formation, its make-up consisting of about 30 per cent lime with the remainder silica, iron and aluminum, possessing excellent cementing qualities and hardness after bonding but only fair toughness or resistance to wear.

The material is by no means a new discovery, as it has been put to many uses for several years as a substitute for other varieties of stone. It underlies thousands of acres of land in Pender, New Hanover and Brunswick Counties, but the best grade is in Pender in the vicinity of Rocky Point, where the quarry used in the construction of the projects was chosen.

Previous to the letting of the contracts, quite extensive surveys were made of the surrounding territory where the marl deposits were known to exist. In many places there were outcroppings. The quarry site near Rocky Point was chosen because tests showed the quality to be as good as, if not better than, elsewhere, the average overburden was as little as that of any other prospect, and it was so located as to give the minimum average haul for the two projects contemplated, particularly the longer Project No. 378.

Test pits were dug at the most likely location and it was found that the stratum was 8 feet or more in thickness, with an average overburden of 4 feet of clay. The samples taken showed two distinct grades of material, one a hard, well-stratified rock, and the other the real marl, which in its natural state contains a large amount of moisture, making it look like gray mud.

As the test indicated an ample supply of hard rock to construct all the projects contemplated as water-bound macadam, the original contract was let specifying a road of this type to be laid in two courses of 5 inches and 3 inches respectively under the regular specifications for two-course macadam.

The contract was awarded to C. W. Lacy, Wilmington, N. C., and he began operations by installing the pumping equipment. One of the chief problems throughout, but anticipated, was drainage of the pit owing to its low elevation and to the fact that all of the surrounding country was only a few feet above the Cape Fear River, the main drainage for this section. Next, a P & H steam shovel was installed and used for both stripping and quarrying the marl, which was drilled by steam, as it had to be shot to be handled readily. The necessary industrial railway system was put in to carry the marl from the pit to screens made of iron bars properly spaced, where the soft and fine marl was taken out, leaving the hard rock, which was then taken to the crusher and there crushed and screened to the proper sizes.

Very soon after operations were begun and only a short stretch of road had been constructed, it was discovered that the percentage of hard rock was far below what had been anticipated, running less than 20 per cent, while the softer marl ran over 80 per cent. Instead of having, as first thought, a stratum of hard rock on top of the marl, it lay in pockets and narrow veins.

This discovery made it quite evident that it would be impossible to carry on with the construction as then specified, using only hard rock, without wasting most of the material from the pit, consequently entailing considerable extra expense to the contractor and limit-

ing the progress of the work to such an extent that it was doubtful if it could ever be completed. Following a conference between the state's engineers and the contractor, a supplementary agreement was drawn up and executed.

This agreement provided for the following design: a 5-inch base course, after compaction, of marl, and a 4-inch, after compaction, of hard rock with a maximum of 25 per cent marl in the top. In return for permission to use the marl, the contractor granted the concession of adding 1 inch to the thickness as noted above, and also another in unit price, reducing it from $1.26 per square yard to $1.20 on Project No. 378 and from $1.75 to $1.69 on Project No. 380.

After the completion of about 3 miles under this new design, it became apparent that there would be great difficulty in continuing the contracts without a considerable waste of marl, as the base was steadily gaining on the finished road because of the scarcity of the hard rock and the excess of marl. The base that had to stay open waiting for sufficient hard rock for the top course began to wear rapidly from traffic, dusted, and also washed from rains.

As a result, the contractor requested another conference with the state engineers, and another supplementary agreement was entered into to construct a base 6 inches thick, after compaction, using the run of the pit, or the marl and hard rock all mixed together, and import hard stone for a 2-inch, after compaction, top course. This new arrangement proved unsatisfactory to both the state and the contractor, as it was very difficult to get a well-bonded or tight surfacing with the imported stone and the cost of importing was prohibitive for the contractor at the agreed price for the completed road; therefore it was soon abandoned in favor of the final agreement, under which the contracts are being completed.

Final Agreement and Specifications

The final agreement effected was proposed by the contractor and accepted by the state, giving the following design: a base 6 inches thick, after compaction, constructed with the pit-run marl with 2 inches of standard sheet asphalt using local sand meeting specifications, all of which is confined within 2- x 8-inch wooden headers, either cypress or yellow pine. There is a modification in the asphalt consisting of a sand-asphalt binder, or cushion, as it is locally called, which is a mix of sand and asphalt in the proportions of 94 per cent sand and 6 per cent asphalt, and of varying thickness from ¾-inch to 2 inches, while the sheet top is reduced to 1½ inches, except where the base is of proper elevation to receive the 2 inches. This modification was made necessary because the marl base wore under traffic and weathered so much. Rather than haul additional marl to bring up the low places, and to eliminate the expense and trouble of scarifying to add this new material, the contractor requested permission to use the sand-asphalt cushion without additional cost to the state, and it was granted. When the sheet top is placed on the cushion, which has been thoroughly rolled, it is heated as near to the maximum specified temperature of 350 degrees F. as possible, so as to make a good bond. All samples taken out show a perfect bond between the cushion and the top. The new unit prices for the completed marl asphalt are $1.75 per square yard for Project No. 378 and $2.00 per square yard for Project No. 380.

To the casual observer the construction methods would appear to be a very simple process of preparing and rolling a good subgrade, then securely staking the wooden headers with stakes 24 inches long of the same material, after which the marl rock hauled in trucks is dumped and spread on the subgrade to a thickness of 8 inches, allowing 2 inches for compaction under rolling. It is then allowed to set or dry out for several days before it can be properly rolled with 10-ton

THE COMPLETED MARL MACADAM ROAD TREATED WITH TARMAC ON NORTH CAROLINA PROJECT 378

three-wheel rollers. The rolling is generally one mile behind the laying. The marl was usually about the consistency of green concrete when placed on the road, although every effort was made to get it as dry as possible at the pit, as it was found that it bonded as well dry as wet, and the more moisture the contractor could get out at the quarry the better it was for him, since he was paying for the hauling on a ton-mileage basis. A fleet of from 90 to 100 Ford trucks were used in hauling after the last change in type.

The engineers and contractor learned by practical experience a great deal about the marl and how to use it to the best advantage. It was always known that the marl could not be properly worked when in its wet plastic condition and it was thought for a long time that it would not bond if allowed to become too dry, so efforts were made to roll it when it was in a certain semi-moist condition. This created difficulties, as some sections ahead would often dry out before other nearer sections, and the roller could not get to them without going over the sections considered too wet to roll. Later it was found it made no difference how dry the marl became, as it bonded just as well, and the rolling was kept far enough back so as to permit the very wet material to sufficiently dry out. The inspector had to watch to see that the hard rock and softer marl were mixed fairly uniformly to secure the best results. Fortunately, the method used by the contractor at the pit assured a very good and uniform mixing of the two grades of marl by arranging his crusher so that hard rock after crushing and soft marl both came together in a bin beneath the crusher and were carried together by a chain bucket loader to the storage bin and there dumped by chute into trucks.

While there is no possible way of knowing as yet, from all appearances the marl asphalt will compare favorably with standard sheet asphalt on a concrete base. Although the marl base may not possess the slab strength of concrete, when laid on a dependable subgrade it should have sufficient slab strength to carry any load it will be subjected to for years to come, and its flexible nature should prevent any cracking of the surface in the event of slight settlements. It is the consensus of opinion of those who have inspected this type that it should give the same service that the more expensive types of hard surface give, and it may be said to the credit of the resident engineer and inspectors that, considering the method of construction, the asphalt surfacing is very smooth and even, making riding easy and enjoyable.

A Propitious Time for Installing New Street Lighting

STREETS built for the slow vehicles of bygone years were not particularly dangerous from the viewpoint of traffic. They were lighted chiefly as a protection against crime and as an aid to police patrol. With fast-moving traffic matters are now different. Even in the daytime accidents are numerous, but with inadequate lighting they are greatly increased. It has been estimated that traffic accidents in this country cost more than a billion dollars per year and that about 25 per cent of these are due to inadequate lighting. In other words, besides the various other benefits of good street lighting this country would save several hundred million dollars a year if its streets were properly illuminated. Since 1919 the number of automobiles has doubled, and there is no reason to believe that traffic conditions will not get worse. Street-lighting improvements and extensions have always been needed, and this need is rapidly growing more urgent. No one who has driven or dodged automobiles will fail to recognize the greater safety of adequately illuminated streets. Even the problem of glare from automobile headlights is pretty well solved where streets are well lighted.

Why is not the present time propitious for street-lighting improvements? Money is cheap and plentiful. Gold is piling up on every hand. It wants work to do. Bond issues can be advantageously floated under conditions which are seldom more attractive than at present. More and better street lighting is badly needed in many places. That it must be provided eventually is inevitable. Why not grasp the opportunity afforded by the present need and by the funds available? Improvement and extension of street lighting may be achieved now with less effort than when money is tight. —*Electrical World.*

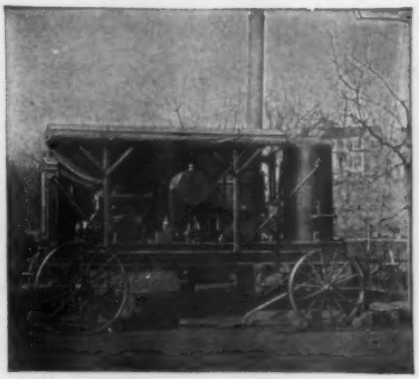
El Paso Installs New Intensive Street-Lighting System

EL PASO, Texas, is said to be the first city of the South and Southwest to install a system of intensive white way illumination. Throughout the mile and a half of the business section the streets are to be illuminated to the extent of 450 to 500 lumens per foot of street, produced by two hundred and forty-four 6.6-ampere, G. E. form 20 luminous arc lamps, with high-efficiency electrodes. These will be mounted two lights to a standard, staggered along the curbing. The arcs, which are mounted on King standards, are enclosed in medium alabaster rippled globes, and are mounted about 21 feet above the surface of the road. The type of lighting unit was selected after considerable study and after samples had been tried in the streets. The installation is being made by the property owners and maintained by the Electric Company at the expense of the city.

Portable Air Rigs Aid Baltimore Water System

By W. B. Weathers

THE water-supply of Greater Baltimore has been the subject of long study and extensive investigation for many years. Actual development of a more modern system was begun in 1919. The first and most important stage in the development was completed in 1923, with the placing in service of the new Loch Raven Dam, which provides a storage capacity of 23,000,000,000 gallons of water, and will be ample to meet the average daily consumption requirements of the city, which are at present 120,000,000 gallons. The water flows from this dam to the Lake Montebello filtering plant through a tunnel 7⅛ miles long and 12 feet in diameter. From the filtration plant the water is distributed to the city mains.

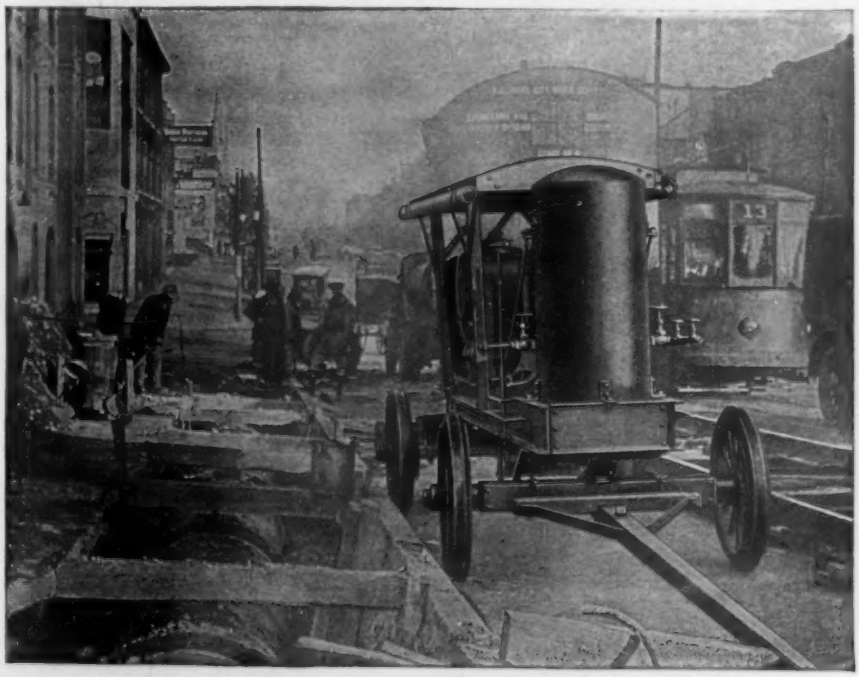


PORTABLE COMPRESSOR, RUNNING DRILLS FOR ROCK EXCAVATION, BALTIMORE

Rock Trenching

The distribution of this water throughout the city is the largest task connected with the new development, and is unusually costly, because of the fact that the main trunk lines and feeders must be run through solid rock foundation for many miles.

If this enterprise had been attempted 15 or 20 years ago, it is problematical whether the city could have afforded it, or whether it could have been completed by the methods then available. To-day, thanks to the development of the small but powerful air-hammer drills,



PORTABLE AIR COMPRESSOR READY FOR OPERATION IN CALKING PIPE JOINTS, BALTIMORE WATER DEPARTMENT

and of reliable and effective portable air-compressor outfits, the work is being done at relatively small cost and at a commendable rate of speed. In fact, compressed air and its adaptation to street work may be said to be responsible for the success of this development, which is so important to the safety and health of the city.

The compressed air trenching equipment of a standard trench-digging gang consists of one gasoline-driven trenching machine; one Sullivan Class WK-31 gasoline-engine-driven portable air-compressor; one standard-gage gasoline-driven 10-ton hoist; two Sullivan Rotator hammer drills; one Sullivan compressed-air spader or clay digger, and the necessary calking tools, lead pots, etc.

The trenching machine, air-compressor and hoist are given very severe duty, as their portable character enables them to be moved rapidly from one job to another, so that while, for example, calking for one gang is completed, and this gang is waiting for the pipe gang to catch up, the outfit is moved to another job for operating rock drills or calking tools. By using one compressor for several jobs in this way, the overhead expense on the air tool work is reduced to a minimum.

In 1919, the first two-hammer drill portable compressor was purchased. This machine had a piston displacement of 150 cubic feet per minute. The compressor and gas engine were mounted on a steel frame with solid cast-iron wheels and solid axle construction. The wear and tear on this unit, when hauled constantly over rough streets, was very noticeable, compared with that of compressors of the same type, which do not have to be moved extensively.

Later units reduced this depreciation by mounting the outfit on a trailer type truck equipped with rubber-tired wheels and springs. These trucks minimize vibration, both when the compressor is in operation and when it is being hauled from one point to another. They secure the same life, practically speaking, as that enjoyed by a stationary machine, while retaining the portable feature, which is absolutely necessary in constructing a number of miles of underground pipe lines.

Use of Drills and Spaders

Much of the clay-digging work is done by the special trenching machine, which handles the clay in open-cut trenches in a very effective manner. For the trenches or enlarged portions of the trench, however, where the pipe valves are set, the pneumatic spader finds advantageous use as compared with hand picks, due to the small working space available. The compressed-air spade can be handled with but little effort on the part of the runner in cramped quarters where he could not swing a pick to advantage. The spade used in this class of work is 5 inches wide, with a short shank. This tool is very easily handled and more convenient than a longer and more bulky type of spade.

In the city proper, the one-man drills put in holes not exceeding 6 feet in depth, as the city officials will not permit heavy shooting. In the suburbs, when the depth of the trench warrants deeper holes, the same drills easily put in 14-foot and 16-foot holes.

The city of Baltimore finds this portable compressor very convenient for this work, as to capacity, as well as in portability and ease of handling. The demand for air varies with each job, and this compressor, with its slow speed at maximum rating, may be used as economically on one calking tool as when operating several spaders or hammer drills, as the amount of work varies in direct proportion with the power consumed. The Water Department of the city of Baltimore at present has seven Sullivan portable compressors, three of which are equipped with rubber tires, and seven hammer drills and one spader.

In order to keep its hammer drills supplied with properly sharpened and tempered steel at all times, the Baltimore Water Department has a class A, all-hammer drill-sharpener with full equipment of dies and dollies and a pneumatic bit punch; a drill steel oil-heating furnace with an electric pyrometer, and a 9 x 8-inch single-stage, belt-driven air-compressor.

A School of Play and Recreation

A SERIES of practical and intensive courses in play and recreation, for playground directors, community workers, club leaders and camp counselors, has been announced by the Heckscher Foundation. The subjects covered include games, athletics, dancing, story-telling, swimming, handicraft, dramatics, and music. The fall term will begin on October 6, morning sessions to be held on Monday to Thursday, inclusive, from 9:30 until 12:00 o'clock, and evening sessions on Monday, Tuesday and Thursday from 7:00 until 9:30 o'clock. Full information as to tuition fees, etc., may be had upon application to Miss Madeline L. Stevens, director of the school, at the Heckscher Foundation, 1 East 104th Street, New York, N. Y.

Passaic Valley Trunk Sewer Completed

Thirty-Year Effort for Removal of Pollution from Passaic River Results in Remarkable Engineering Project

LARGE projects inevitably must pass through vicissitudes, but it is probable that few have had as large a share of difficulties and delays to overcome as the $20,000,000 Passaic Valley trunk sewer, which has finally arrived at the point of completion and the flume opened from Paterson to New York Bay for actual use. It is almost 30 years since the first suggestion was made to clear the Passaic River of sewage by the construction and operation of an intercepting sewer to the sea, but it is only a dozen years since the construction work has been actually under way.

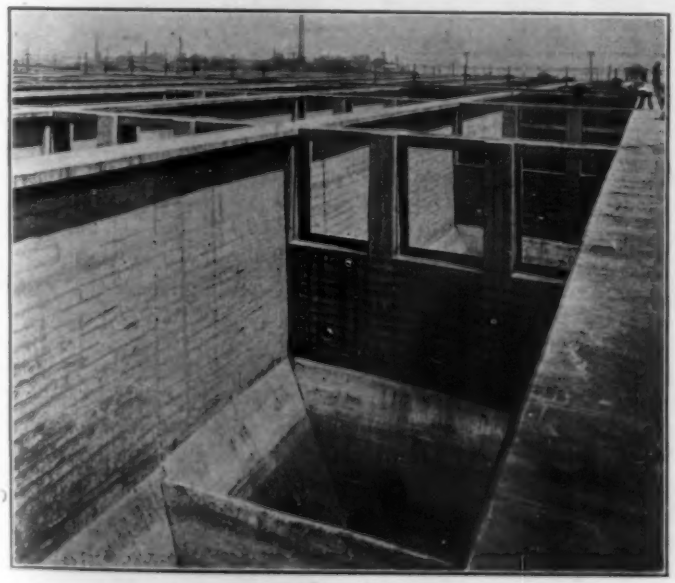
One of the first stumbling blocks in carrying out this project was the reluctance of the smaller communities to participate, their first objection being against the method of apportioning the cost. Opposition, first finding concrete expression in the New England Society of Orange, was based on the contention that the municipalities should be assessed according to their prospective use of the sewer rather than on their tax ratables, the method adopted finally. These objecting municipalities placed argument after argument before the Sewer Commission to carry their point, but were unsuccessful and then began to cast about for some other way to obey the mandate that soon took form in legislation forbidding pollution of the river by sewage.

SECTION OF 96-INCH TUNNEL OF THE PASSAIC VALLEY SEWER

Suits Caused Delays

Two lawsuits, one brought by Paterson, which was among the reluctant municipalities, and the other by New York City, which objected to the prospect of pollution of its waters, operated to cause the longest delays. Both of these suits were won for the sewer project, and Paterson eventually joined in. The New York suit had one result in bringing about a decision to have the sewage treated before being emptied into the bay.

Year after year a new date for the end of pollution was set by the Legislature, and year after year this date was extended as one thing or another arose to delay getting at actual work. In the meantime, about every known method or scheme for treating sewage so that it would not pollute running streams was tried out by one or another of the dissenting mu-



A PART OF THE BATTERY OF SEPTIC TANKS AT THE NEWARK BAY PUMPING-STATION

nicipalities in the district affected by the sewer act, and one after another these schemes were all abandoned. As this occurred, each municipality signified its willingness to join in the scheme, and the most important step came when East Orange, originally balking at a $500,000 estimated cost, agreed to pay Newark $825,000 as an initial price for taking care of the sewage from the suburban municipality. Orange, which only recently applied for a share of the project, was the last to fall in line.

The original municipalities participating with Newark were Paterson, Passaic, Harrison, Kearny, Belleville, Clifton, Nutley, East Newark, Garfield, Lyndhurst, Rutherford, East Rutherford, Wallington and North Arlington. Those which came in afterward, besides Orange and East Orange, are Montclair, Prospect Park, Haledon, Glen Ridge, and Bloomfield.

Twelve Years' Construction Work

In the twelve years the work of constructing the sewer has been under way 165 separate contracts have been awarded, 30 miles of pipe laid in solid ground, 10 miles or more of tunnels driven beneath two bodies of water and underneath a city, 3 pumping-stations and a gigantic clarification plant built, and approximately $20,000,000 expended. Incidentally, several contractors have seen their hopes of financial success fade as they were crushed beneath the weight of unanticipated rises in cost. On one section line three contractors failed and the work had to be completed by the Commission itself.

Starting at River and Prospect Streets, Paterson, the land end of the sewer, the big flume through which a man can walk erect, wends its way through a half-score of municipalities to the banks of Newark Bay, where the filtration basins and the largest of the three pumping-stations are located. Then the flume passes underneath Newark Bay at a depth of 250 feet, and under the city of Bayonne, from which it passes into New York Bay and continues underneath the latter for approximately 15,000 feet.

Along the line of the land sewer, in addition to the Newark Bay pumping-station, are two others, one at the junction of the Third and Passaic Rivers, designated as the Yanticaw station, and the other at Clifton, known as the Wallington station.

Five major steps are necessary when the sewage reaches the clarification plant on the meadows to make it suitable for discharge at the outfall tunnel under New York Bay. As the sewage reaches a point 50 feet from the pumping-station it passes into a chamber divided into three parts. In each chamber is a pit several feet deep. As the sewage passes through these pits, all gravel and stones fall to the bottom. A clam-shell bucket will remove the gravel, which will be carried by cars to the near-by meadows for fill. Beyond these grit chambers the sewage enters the screen house, where three sets of electrically operated double screens are installed. These screens catch all floating débris that has come past the grit chamber. The remainder of the sewage goes to the clarification tanks. The two screens in each set are raised alternately, the materials caught in them raked off and pressed into cakes, dried and burned in the boilers. The sewage meantime passes through a set of fine screens, and then it is pumped into the clarification tanks.

The tanks are built of concrete. Underneath them runs a series of galleries in which are located the mechanism operating the various gates which control the sewage and the system by which the tanks may be cleansed by sea water obtained from Newark Bay.

The Clarification Tank

Three sets of pumps are required to carry the sewage to the clarification tanks, which are about 300 feet from the pumping-station. These pumps are about 40 feet below the surface and operate at a speed of about 100 revolutions a minute, capable of handling 100,000,000 gallons daily. Space has been provided for installing a fourth unit when it shall be required.

Reaching the clarification tanks, which are built in 4 sections of 27 units each, or 108 in all, the sewage flows through the tanks at a speed of one-half an inch a second, with the result that the suspended matter settles to the bottom, which is hopper-shaped. When the hoppers are filled to a certain level with sludge, a gate is opened in the bottom and the pressure of the water above sends the sludge through a large pipe to the water-front, about 2,000 feet away, to be loaded on tank barges and carried more than 10 miles out to sea for dumping.

The sewage, from which a large portion of organic matter has been removed, runs to the water-front and falls 250 feet into the tunnel which runs underneath Newark Bay across Bayonne and out into New York Bay, a distance of five miles.

To facilitate repairs to the pumps, an electric traveling crane is installed in the main pump-house. This crane has a capacity of 20 tons.

The Power-Plant and Pumping-Stations

Nine tubular boilers, each of 250 h.p., located in an annex to the pumping-station, furnish the power for the pumps. Room has been provided for the installation of a tenth boiler at the time the fourth pump is added.

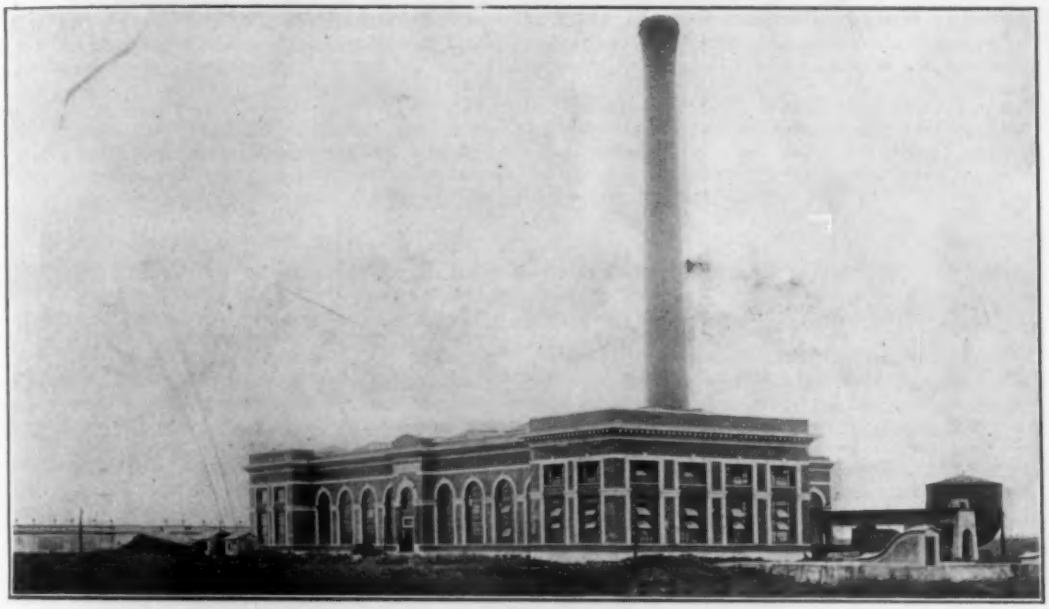
Coal for the power-plant is stored in a building capable of holding 10,000 tons at one time. The plant has its own railroad siding running from the Newark Bay Railroad, the tracks rising on a trestle that passes through the coal storage house high above the floor.

Elimination of odors about the plant will play a considerable part in the operation. In so far as the pumping-station itself is concerned, it is believed that the greater part of this elimination has been solved by the erection of a 200-foot stack, running to which are flues from various sections of the station.

The isolated location of the sedimentation tanks in itself solves some of the problems of odors from the tanks, but the real problem will present itself when the surrounding section begins to build up. Plans have been made so that when this occurs the tanks can be covered and the odors conveyed through flues to another giant chimney to be built when occasion requires.

The Yanticaw and Wallington pumping-stations are small compared to the one on the Newark Bay front. The former is capable of handling 6,500,000 gallons of sewage a day, while the latter can handle approximately 30,000,000 gallons. The Yanticaw station will handle the sewage from the low-lying section of East Rutherford and adjoining towns, while the Wallington station will care for the sections of Passaic, which are below the level of the main sewer.

At the time the sewer was planned, in 1912, it was to have been completed by 1916. At that time the estimated daily flow of sewage in the cities to be served was approximately 90,000,000 gallons and the flume was designed to care for the output of these municipalities until 1940. In the meantime the flow has steadily increased, and instead of 90,000,000 gallons it is estimated the flow will be approximately 130,000,000 gallons a day. This will have no bearing on the date when the maximum capacity is expected to be reached. Some years hence the municipalities along the Passaic will again be forced to discuss an extension of the sewerage works.



THE NEWARK BAY PUMPING-STATION

Measurement and Analyses

Careful watch will be kept on both the quantity and nature of the sewage passing through the trunk sewer. It will be measured as it passes from the pumping-station to the tank, and careful analyses will be made daily to determine just what kind of waste is turned into the sewer.

In the northeast corner of the meadow pumping-station a complete chemical labora-

tory has been installed. Not only will the sewage be analyzed, but frequent analyses will be made of the waters of New York Bay so that friction between the Passaic Valley Trunk Sewer Commission and New York City may be avoided. It has been because of the friction that has already occurred that the completion of the sewer has been delayed. New York City in its litigation bitterly fought the project to make the outlet of the sewer in New York Bay, and succeeded in having the Federal Government, through the War Department, intervene in the suit, but later the Government withdrew and a decision was given by the United States Supreme Court in favor of the Commission. No effort was made to do construction work at the New York end while the litigation was under way, as it was felt that this would be an affront to the Court. Work was done, however, on the Paterson end, thus building the sewer backward.

ACKNOWLEDGMENT.—Illustrations by courtesy of *Newark Evening News*.

Water-Supply

THE human race must have recognized, even in its earliest days, the relation of water to life. Even the nomadic tribes had their movements guided by the location of oases and streams, and it is well known that the first civilizations developed along the shores of such rivers as the Nile and the Euphrates. Wells were common in ancient Egypt, and some of them appear to have been of great antiquity. Likewise the practice of impounding water in reservoirs and holding it for times of need is known to have existed long before the beginning of the Christian era. There were great rain-water cisterns in Carthage as early as 150 B.C., and at Athens there were infiltration galleries for collecting ground water-supplies. Water-supply may therefore be regarded as one of the oldest among community requirements. It antedates fire protection, sanitation, poor relief, education, and most of the other activities upon which a modern city bestows attention.—*Exchange*.

Cleaning Water-Mains in Scotland

THE water-supply of Helensburgh, Scotland, is obtained from the Ballyvoulin Burn, 3 miles distant from the reservoir. The water, after settling, does not require filtration, and the existing filter beds, which are inadequate to deal with the present consumption, are to be emptied and used as storage tanks. Trouble has been experienced with the growth of a variety of chara in the reservoirs, necessitating occasional emptying and cleaning. The weed does not flourish on the pitched surface of the banks, in those parts occasionally exposed to air and sun, or at depths greater than 12 feet.

Greater difficulty is caused by the growth of a fairly soft nodule of rusty appearance composed of hydrated ferric oxide and vegetable matter in the mains. In one instance a 5-inch pipe on a gradient of 1 in 7 was rendered impenetrable to water under a pressure of 75 pounds. Surfaces completely coated with nodules to 1¼ inches in thickness are frequently encountered. The two 8-inch pipes which convey the water from the fountain head to the reservoirs were scraped in 1909 and in 1920, the capacity being increased from 40,000 gallons per hour to 52,500 in the former year, and from 35,000 to 51,000 in the latter. In 1920 the scraping was carried out with a Glenfield scraper at a cost of 3d. per yard. The town pipes were cleaned by hand, 85 yards in each direction being dealt with from one opening, at an approximate cost of 3d. per yard per inch in diameter. The scraping considerably more than doubled the discharge from certain hydrants and the day pressure was increased from 45 to 80 pounds and the night pressure from 85 to 106 pounds.

STREET LIGHTING 75 MILES AWAY AS SEEN FROM THE SUMMIT OF MT. WILSON, CALIF.

In the foreground of this remarkable picture will be seen Pasadena. The irregular patch of dense light, slightly blurred, is Los Angeles, stretching out to the right into Hollywood. This picture was taken solely by the light from street-lighting installations and the multitude of automobiles which traversed the streets of these communities during the two hours that the plate was exposed

The Difficulties of Street Cleaning

Abstract of a Report on Municipal Street Cleaning in Philadelphia, by the Bureau of Municipal Research of That City

THE actual cleaning of the streets probably appeals more to public imagination than does any other service performed by the street-cleaning division. Public decency and convenience require that the streets should be kept reasonably clean, while consideration for the public health demands that at frequent intervals there should be thorough cleansing, especially of much-used streets.

It is obviously impracticable to keep all the streets clean at all times. Even if expense could be disregarded, there are many practical difficulties. In the down-town district of any city, by using a very large number of "block men," or "white wings," it would be possible to remove accumulations of dirt so frequently that the streets would have the appearance of great cleanliness. Yet they would be covered with a fine dust that the block men could not remove, and this fine dust on a windy day would prove extremely objectionable. It can be removed only by cleaning methods that cannot be used during the working day, when the traffic is heavy. Even though this fine dust is removed during the night, there will be a new accumulation before the following business day is over. Some of this dirt comes from the sidewalks, which the city does not clean, although they are a part of the public highway; and some comes from store sweepings which are placed in the street in violation of city regulation.

The appearance of the workmen has not received sufficient attention. Neat workmen may inspire the public with a desire to cooperate in the work of keeping the streets clean.

Unfortunately, the kind of paving used on many miles of streets cannot be thoroughly cleaned. The streets paved with rough, traffic-worn, granite blocks, originally laid on a dirt foundation without a joint filler, can, of course, be given only a rough cleaning. These streets, however, produce little dust on a windy day, because the dirt is held in the depressions between the blocks. While sheet asphalt paving, laid on a concrete base, can be very thoroughly cleansed with water, provided the street grades are not too flat, there are many miles of older asphalt pavements, laid on a broken-stone base, and now uneven of surface and frequently in wretched repair, which cannot be readily or thoroughly cleaned.

Relative Value of Various Methods of Street Cleaning

To analyze the methods of street cleaning now employed in different sections of the city, or to attempt to indicate what methods are best under the conditions encountered, is not considered within the scope of the report. It is stated, however, that it should be understood that there is no one method of street cleaning that is effective under all conditions of pavement surface, street traffic and weather. The most effective and economical apparatus and methods must be determined by study and experience, and the apparatus and methods must be changed from time to time as conditions require. Perhaps the motor flusher has at present the greatest all-round usefulness; but it cannot be used on many of the older pavements, especially those composed of blocks laid on a dirt base. However, on a smooth, impervious pavement which has a proper crown and grade, the use of sufficient quantities of water under pressure, as from a motor flusher, is very effective in removing not only the coarser dirt, but also the finer dust. This is especially true if the street is flushed twice, or if it is sprinkled prior to flushing. Water may also be applied by hose flushing, although this method is used less now than formerly. Vacuum sweepers have given a certain amount of satisfaction in some cities, but they are of no value when the pavements are wet. The horse-drawn broom is used more or less in practically all cities. It removes only the coarser dirt, and on a smooth pavement usually smears the dirt in a thin film over the entire surface. On rough pavements, where a high degree of cleanliness cannot be obtained, the use of horse-drawn brooms is doubtless economical. The motor sweeper, which sprinkles and sweeps with one operation, and which is usually provided with a pick-up belt and a dirt-storage box, should not be viewed as a new method of cleaning but only as a step in the substitution of motors in place of horses

and men. The motor sweeper is also made with a special broom for cleaning the gutter. Like some other forms of street-cleaning equipment, it operates best on well-paved streets with an even curb and gutter. Its use on roughly paved streets is destructive of the mechanism.

Of great importance in the list of facilities are the block men, or white wings. It is impossible to build a machine that has the intelligence of a workman. The hand-broom sweeper can do certain kinds of cleaning that a machine cannot do at all. The so-called alleys must be cleaned by hand labor, and on streets with numerous depressions or irregular gutters, hand brooming alone is effective. If the block man cleans only the gutters and the scattered accumulations of dirt on the crown of the street, he is capable of covering a considerable territory in a day's work. Automobile traffic throws the dirt from the street into the gutter, and in many localities all that needs to be done to make a street attractive is to clean the gutters and to pick up the litter. In districts with well-paved streets, cleaning by block men is very effective if supplemented by flushing. As a result of a detailed study of methods, the officials of the Street-Cleaning Division in Philadelphia are of the opinion that the number of block men will be further increased by as much as 75 per cent in a few years. If block men are to become so important a part of the organization, their wages should be increased so that better laborers can be obtained. Heretofore, the most inefficient and the physically defective have been used for this work.

The appearance of the workmen has not received sufficient attention. In the eyes of the public, block men personify the street-cleaning work, so that untidiness may easily be assumed to imply inefficient work. Neat workmen, on the other hand, may inspire the public with a desire to cooperate in the work of keeping the streets clean. It is probable, also, that a man who is neatly uniformed will feel a desire to justify his equipment and appearance and will do better work. For these reasons, it is important that the block men be neatly dressed when they are at work; and as the white uniform is typical of cleanliness and has become traditional in this service, it should be continued. In order that the cost of this equipment may not prove burdensome to the workmen, provision should be made for it in the wage.

Street Improvements in Fernandina, Florida

FERNANDINA is a city of about 6,000 population, situated at the northeast corner of Florida on an island. The first street improvement consisted of grading shallow ditches along the sides and throwing the spoil in the center, after the manner of improving country roads. When traffic conditions demanded hard surfacing, this was accomplished by dumping on top of the elevated streets a layer of oyster shells from 4 to 12 inches thick. Thus, in the course of time the streets were built up to a height from a few inches to a few feet above the abutting property, and even the streets themselves had depressions between intersections from which the water could not escape. In a country subjected to an annual rainfall of about 60 inches, and an occasional 24-hour precipitation of 8 inches, such elevated streets produced conditions somewhat annoying.

Since the commission-manager form of government was put into operation in September, 1923, grade lines have been run on shelled streets in the vicinity of occupied blocks, and elevations taken on property adjacent thereto. From these data a topographic map has been prepared with 1-foot contour intervals. After considerable study and a large amount of cut-and-fill, permanent street grades were established, and profiles platted on tracing cloth to a horizontal scale of 50 feet to 1 inch, and a vertical scale generally of 1 foot to 1 inch. The absence of large flat areas and the presence of many small ridges and hills permitted permanent street grades to be so fixed as to be, at all places, below the adjacent property, and yet not flatter than 0.2 nor steeper than 4 feet per hundred. This work is still in progress and has been carried well beyond any possible early need.

It is proposed to systematically regrade and resurface a few streets at a time, so that all will be brought to the new established grade within a reasonable period and without undue financial burden. A sum equal to about 10 per cent of the annual tax income will be so used each year. For the first year none of this work could be done, as it was more essential to oil certain streets and make extensive repairs to all shelled streets, which had been long neglected. In addition to this, the city built more permanent pavements in the past year than during its entire previous history. For so-called permanent pavements the city pays one-third and the abutting property two-thirds of the entire cost. The old City Council administration incurred certain debts without providing financial means for discharging them. The new administration had to include these as "Extraordinary Expense" in its first budget. The permanent pavement program was limited this year to a cost which would permit the city to retire its proportion by including in the next three annual budgets for street work an additional sum equal to the amount of this extraordinary expense, and the work was financed without the issuance of bonds.

The Essentials of an Efficient City Engineering Department

By W. E. Weller
Bureau of Municipal Research, Rochester, N. Y.

THERE are five essentials in an efficient city engineering department: (1) a well-qualified city engineer; (2) carefully and sharply defined duties and powers; (3) a loyal and capable organization; (4) satisfactory quarters and sufficient equipment; and (5) complete records painstakingly kept.

Essential No. 1—A Well-qualified City Engineer

A really well-qualified city engineer would have the disposition of an angel and the education and the technical skill of all the scientists that have added their bits to the sum of the world's knowledge. Physically and temperamentally, the city engineer needs, under existing circumstances, a good appearance, a persuasive tongue, and a thick skin. His education must be broad and general and at the same time specific and detailed. It seems needless to add that this education should be along engineering lines, but occasionally this basic requirement is overlooked. After considering the various qualifications for a city engineer as regards training, it would seem that no man should be considered for the position of city engineer unless he has a college degree or else very exceptional ability well proved.

In his relation to the public, the engineer occupies the position of an expert and must stand ready, if need be, to sacrifice personal popularity to the public's good. I do not mean that eternal disagreement with his public entitles him to a place in the Hall of Fame. Neither do I mean that he should extract a martyr's joy from public criticism. Rather he should be hurt, cruelly sometimes, by public censure even when he knows that censure to be unmerited. In his contact with the public the city engineer must be patient to the highest degree. It is part of his job to meet the public and its individual components about 40 per cent better than half-way.

With these rather sketchy remarks, now let us consider the city engineer in his relation to the four things with which, officially, he has mainly to deal. These four things are: the administration, the public, the contractors, and the subordinates.

The relation of the city engineer to the administration of which he is a part has been the subject of discussion that has, at times, shown a trace of acidity. A group of city engineers, thinking, I fear, rather of their own petty dignity than of the principles of good organization, have for the last half-dozen years or so been agitating more or less violently for freedom from the nominal leadership of the chief of the public works department. I believe that this move is ill-advised. The besetting evil of municipal government to-day is the existence of a multiplicity of independent and semi-independent departments, boards and commissions, whose functions cross and crisscross and overlap until even ordinary efficiency is lost in a maze of red tape and buck-passing. The sooner we realize that good organization calls for the simplification of the present awe-inspiring conglomeration of independent municipal agencies into four—surely not to exceed six (Finance, Public Works, Public Safety, Public Instruction, Public Welfare and Law) — properly coordinated and centralized departments, the better for all concerned. One of these should be the Department of Public Works, which should be divided into two bureaus, the Bureau of Construction and the Bureau of Maintenance. The city engineer should be the head of the Bureau of Construction.

I would make two radical changes in the status of the city engineer affecting his relation to the administration: first, I would remove him entirely from contact, except in an advisory capacity, with the general executive functions of the municipality; and, second, I would make the position a real, honest-to-goodness, civil service position. In being released from contact with the general executive functions he would relinquish his chair or chairs in the governing board or boards of the city, such as Boards of Contract and Supply and Boards of Estimate and Apportionment. He was probably placed on these boards, where they exist, because it was felt that his technical knowledge might be needed at times by the

boards. The fact that this technical knowledge is just as available in an advisory capacity, and, in such a capacity is likely to be less fettered, was overlooked. If there is any man in the city employ who should be "out of politics" for good, sound political reasons, it is the city engineer.

The second suggestion was to make the city engineer a civil service employee. It took me a long time to arrive at that decision. A vivid picture of the average disloyal, time-serving, civil service employee held me back. Even now I only accept the idea as the lesser of two evils and I am ready to admit that the wrong sort of individual in the position of city engineer will undoubtedly make the plan a lamentable failure. Put a cantankerous fool or an inclinational pauper—I refer to the man who fails to realize that accepting a dollar for seven cents worth of service reduces the acceptor to the level of a pauper, and a dishonest pauper at that—into the position and you will rue the day the change went into effect.

This portion of the paper dealing with the relation of the city engineer to the public holds infinite possibilities for unnumbered platitudes and semi-religious sob statements. I shall endeavor to avoid them. In his relation to the public, the engineer occupies the position of an expert and must stand ready, if need be, to sacrifice personal popularity to the public's good. I do not mean that eternal disagreement with his public entitles him to a place in the Hall of Fame. Neither do I mean that he should extract a martyr's joy from public criticism. Rather he should be hurt, cruelly sometimes, by public censure even when he knows that censure to be unmerited. In his contact with the public the city engineer must be patient to the highest degree. It is part of his job to meet the public and its individual components about 40 per cent better than half-way. Such an exercise of patience does not necessitate any infringement of self-respect. The engineer should religiously avoid any superfluous idea of his own superiority. Any time he catches himself referring to the non-technical components of the public as "laymen" he should pick a fight with a local Dempsey and take a beating as the only sure way of bringing his view-point back to normal. Personally, I feel that the city engineer should take the attitude that he is working for the public and that if every man who comes to his office for the purpose of registering a complaint knew as much about engineering or municipal procedure as the engineer himself, there would be scant need for engineers.

It has been my observation that the engineer who enjoys the reputation of being a difficult man for contractors to get along with is usually acclaimed the paragon of virtue by city officials and citizens alike. This is most unfortunate, because an engineer, in his effort to court popularity is most likely to fail to distinguish between firmness and foolishness. It is so easy for the engineer to bathe in the public esteem by adopting the popular view-point that a contractor is just naturally a criminal. If this merely affected the engineer, it would not be a matter of concern. It does, however, affect to an unmeasurable degree the city in whose interest the engineer is supposedly working. Contractors are business men. They are in the contracting game to make a living. If they do not succeed in making a living, they drop out of the game, and others, more successful, take their places. If a city engineer establishes the reputation among contractors of puttering over unimportant details, of sneakingly placing things that he forgot on the shoulders of the contractor, it must not be forgotten for a single instant that the contractor adds a percentage to his bid that is ample to protect him from these whims, fantasies and failings.

The engineer who has the courage to be fair with contractors is an asset to the city that employs him. He has a worth in actual dollars and cents to the municipality that can only be approximated. I have absolutely no patience with, or regard for, the engineer who writes his specifications in such a way that he can make the contractors responsible for anything and everything which he himself may forget. Such a man is not only a poor engineer, but he is a coward and an economical failure. I do not say that an engineer should forget to be firm. He should write specifications that are fair, he should draw plans that are comprehensive and clear, and then he should insist that these specifications were written and these plans drawn to be followed without variation, except in unanticipated contingencies, in the execution of the work covered. In other words, he should endeavor to convince the contractors that they will be treated with impartial firmness and fairness.

The relation that exists between the city engineer and his subordinates is complicated and made nearly impossible by the existing civil service law in many places. You will remember that in an earlier paragraph I recommended that the civil service law be extended to apply to the city engineer. I am now going to recommend that the same law be restricted so that all subordinates in the city engineer's office are removed from its protection. I real-

ize that this is not strictly logical. You will remember, though, that the recommendation to place the city engineer on a protected civil service status was made only as the lesser of two evils. I believe that the practice of protecting rodmen, chainmen and clerks by the civil service is an untold loss of efficiency. It is the tendency for the employees under this system to feel that they are not responsible to their immediate superior and to assume that efforts to please him are relatively unimportant. I further believe that the operation of civil service requirements is such as to bring mediocre or inferior persons into the city service and to retain them there, while the superior employee becomes disgusted and quits. It is to my mind one of the most important essentials that the city engineer be allowed to develop, independent of any outside influence, a personnel in his office that will respond, because of a proper morale, to any request or demand that he may make of it. I believe that this will be best secured by making the city engineer the only civil service employee in the engineering department. If that condition exists, it will be unnecessary to protect the subordinates. If they are worth the money that the city pays them, they will be loyally protected by their civil service superior.

The Essentials

I. A Well-qualified City Engineer
II. Carefully Defined Powers and Duties
III. A Loyal and Capable Organization
IV. Satisfactory Quarters and Sufficient Equipment
V. A Complete System of Records

In spite of the deadening influence of the present civil service, I feel that any city engineer is a failure who does not at least try to develop an esprit de corps among his force. He should place upon each employee a definite degree of responsibility and should strive in every way to make the work of the office interesting. Weekly conferences, even on city time, are worth more than words can tell.

Second Essential—Carefully Defined Powers and Duties

The second essential is a clear and sharp delineation of the powers and duties of the city engineer. In the average city charter these powers and duties are poorly defined, to say the least. Sometimes, as in the case of paving procedure in second-class cities, the charter provisions are almost pernicious. The city engineer should have direct charge under the supervision of the head of the public works department, of all engineering work undertaken by or for the city. This work includes not only all required surveying and mapping, but also the planning and construction of all public work that would nominally be supervised by an engineer or by an architect. I refer to schools and hospitals and fire houses, as well as sewers and bridges and pavements. I do not mean that municipal engineers shall set themselves up as architects, but I do believe that any part-time or full-time architect employed by the city should work under the direction of the city engineer. I feel that there is need for more engineering and less architecture in the majority of our public buildings.

Making the engineer responsible for all municipal engineering work is only one step in the classification, coordination and consolidation of municipal functions that most of us realize to be so necessary. The day is coming when your assessors will be responsible for all assessment work; when your city treasurer—unless you decide that you can get along quite as well without one—will be responsible for the collection and disbursement of all city money; when your councils will consent to become truly and merely legislative bodies. Then I expect you will eliminate the engineer in the water bureau and the engineer in the educational department and the engineer in a dozen or more other offices and consolidate their duties and functions in the hands of one man—your city engineer.

Third Essential—A Loyal and Capable Organization

In regard to the organization that is allowed to the city engineer, there is much that might be said. I will crowd it all into the bald statement that usually the organization allotted to the engineer by the council or controlling body is utterly and entirely inadequate. The board members and the councilmen are thoroughly convinced that the engineer is a hopeless dreamer who needs the scrutinizing care of practical men to keep him from paving the streets with "moire silk."

I believe there exists a fairly definite ratio between the size of the force required by the city engineer and the population of the city. It seems that a fully adequate engineering department requires a field party of three men, headed by an instrument man, for about every 30,000 of population. In arriving at this fig-

ure, I have in mind the ordinary routine work now performed by the average city engineer. There should be an assistant engineer for each class of work for which the office is responsible. For example, if the city engineer has charge of pavements and sewers and water-mains, he should be allowed three assistant engineers, one of whom should be assigned to each of these functions. A well-balanced office requires one draftsman for each field party. A clerical force is needed consisting approximately of one person for every 50,000 of population in the city in question. This organization is headed by a deputy, or, in case the architectural work is also assigned to the city engineer, by two deputies, one of whom should be an architect. With this organization the engineer should be able to care for all the routine work that may be required of him. Special jobs of any magnitude cannot be handled by this organization without neglecting the ordinary routine work. The field parties should not be definitely assigned to any particular work, but should be attached as needed to the work directly supervised by the assistant engineers. The same suggestion applies to the draftsmen. It seems superfluous to add that with such an organization, the engineer should be scrupulous in observing the proper method of giving orders and directions. Except where absolutely necessary, no orders should be given concerning any other matter than assignments to any one in the organization of a lower rank than assistant engineer, and in all cases all superiors of the person to whom the order is given should be notified as soon and as completely as possible. This is basic, but is disregarded so often that its inclusion here is justified.

Inspectors should be directly responsible to the engineer and should be assigned to, and should report through, the assistant engineers. There is no need with the organization that I have outlined for such a person as chief inspector. It is unfortunate that the custom of paying inspectors out of construction money is almost universal and that large inspection charges against small jobs are looked upon with scant favor by the authorities. Some of the smaller jobs are more in need of careful inspection than some of their larger relatives.

Fourth Essential—Satisfactory Quarters and Sufficient Equipment

The equipment of the city engineer is usually, as with his organization, inadequate. I have learned, when looking for a city engineer in a strange city, first to investigate the basement and, not finding him there, to skip all intermediate floors and seek him in the attic. I cannot explain this phenomenon, but can state it as a fact. Occasionally, an engineer is given adequate quarters. The engineer should have a private office to which he can retire for uninterrupted study. In addition, he should have a public office in which should be the desks of the deputy engineer and the secretary. It is in this office that all business should be transacted. No contractor or material man should be allowed under any consideration to force or worm his way into the private office. The public office should be supplemented by a waiting-room. This room, in order to economize space, may also be the public contact room to which plumbers come for sewer measurements and to which the general public comes for such information as is procurable only from the city engineer's office. There should be a general drafting-room equipped with at least two tables for each of the draftsmen. There should also be provided a smaller room that may be used for a drafting-room on special work and for a computation room. Ordinary principles of efficiency, to say nothing of humanity, require that drafting-rooms be properly lighted. The assistant engineers should each have a desk in a general office. The field force should never come to the general office, but should assemble in a room convenient to some exit. This room should contain lockers for the men and for the instruments. The rule of keeping the field men out of the general office should be rigidly enforced. On rainy days there is practically nothing that the average field man can do in the general office or in the drafting-room. Consequently, if he is allowed to remain in either of these rooms, he becomes a nuisance, hindering the work of other men and giving the public a bad impression as to the efficiency of the office. With definite quarters, the field men can be made responsible for certain of the less complicated records and for the care of the instruments and tapes, to the benefit of all concerned. This may seem an elaborate layout, but I feel that it is the minimum and that such a layout will pay for itself many times over in increased efficiency.

Transportation equipment is another debatable point. Personally, I believe that the city engineer should be equipped with a car for his personal use. The office should also have at least one car for every two field parties, unless it is considered advisable, as in Pittsburgh, to use taxi service in transporting the men from the office to their jobs and from the jobs to the office. It does not need elaboration to prove that rapid transportation to and from the job is good economy.

In the matter of instruments, there should be one transit and one level for each field party. In addition, there should be at least one of each instrument in reserve. I think that engineers tend to be over-elaborate in their choice of instruments. One of the levels and one of the transits should be fairly heavy instruments capable of the most exacting work. The other should be as light and as simple as the work will possibly permit. The heavy instruments, it will be found, drop very naturally into reserve. Certain special equipment, such as recording meters, flow meters, plane tables and the like, are necessary and should be added from time to time to the equipment. An engineer would do well to adopt a definite schedule for purchasing equipment, aiming to make each year certain definite additions to this special equipment.

Fifth Essential—A Complete System of Records

I wish something might be said that would adequately stress the need for records in a city engineer's office. So much of the engineer's work is for the future, so much is open for misconstruction, that adequate records are necessities, not luxuries. A job is not well done that does not leave a full and complete record behind it for the protection of the present and for the information of the future.

The first requirement in the line of office records is a general index to the information—all the information except the correspondence—that the office contains. Since the engineer's work is mainly in or along streets, the street is a most convenient basis for the index. This general index should cover all maps and plans; all field notes and construction memoranda; all ordinances, resolutions or reports of the common council having to do with construction work, street location, street grades, and all other matters of interest to the city engineer; in fact, all the information that the office possesses. The index should be, with the exception of the correspondence index, which will be described later, the only index in the office. There are offices that I have known where indexes were so plentiful that I have wondered how the engineer ever managed to get along without an index to the indexes. Three-by-five cards, with colors to repreesnt different classes of information, make the most satisfactory equipment. These cards, when filed back of guide cards, labeled with the names of the streets, give at a glance all the information that the office possesses regarding any particular street.

Before proceeding to any specific suggestions regarding the remainder of the office records, I want to impress one general observation on the minds of all. Uniformity in size and simplicity in form are two of the basic and absolute essentials of a successful system of records. It is far better to waste a little space or to crowd your information a bit in order to make all record forms of a uniform size than to adopt a different size and shape for every form. The need for simplicity is too well recognized for discussion. There is a third general requirement that may be considered somewhat subordinate to the other two. I refer to convenience in the size of the forms. Since fully half of the information consists in having it where you want it when you want it, I have come to the conclusion that a pocket-size sheet is best for all standard forms. This means some inconvenience in regard to typewritten work, but I feel that the inconvenience is much outweighed by the advantages.

Field notes are the most common and the most abused form of engineering records. More than 99 per cent of field notes are unintelligible, even to the recorder, after six months have elapsed. In the average office this condition is so well recognized that no one ever thinks of consulting "cold" notes. Field notes should be kept in a form prescribed by the office head and should be kept on loose-leaf sheets of the same size as those used for inspectors' reports. All general field notes should be filed in envelopes labeled with the street name. Field notes having to do either with the preliminary work, progress or final measurements of construction work should be finally filed with the inspectors' reports covering that particular job. Personally, I have a feeling that sudden death should be the penalty for any failure to properly label and date each sheet of field notes.

Maps and plans should be on uniform sheets of a convenient size. I have found that a sheet 21 x 30 inches is the most convenient. Such a sheet can be handled on the job and in the office with the least effort. In the matter of maps and plans it again seems better to do violence at times to the draftsman's idea of a proper scale in order to obey the dictates of uniformity. Where maps are made indiscriminately on scraps of paper or on sheets the size of a living-room wall, it is very difficult to file them properly. I believe it is safe to say that very, very few of such maps live to a ripe old age. Specifications are office records which are much neglected. Even standard specifications are, or should be, in a constant state of revision. This means that the specifications under which a paving job is done to-day might be considerably different from those used on a

similar job last month or those that will be used next month. Consequently, it seems that the specifications under which a job is done should become a part of the office records and be filed with the reports. In my own pet system of records and reports the specifications were printed on sheets of the same size as the standard reports and at the close of the job were bound with the reports to make a complete record. I found that pocket-size specifications had another advantage. The inspector could carry them in his pocket on the work without the semblance of discomfort, and a decided tendency became apparent among the inspectors so to do. The tendency promoted to a considerable degree the reading of the specifications.

Reports are either disregarded entirely in the average municipal office or are kept with such scant attention to details and accuracy that they are of no practical value. I believe that a system of reports should be part of the city engineer's religion. In my own experience four types of reports were found desirable. First, a report was required from each of the employees of the office covering his daily work. These reports showed the nature and the location of the work on which each employee was engaged each day. They were originally intended to assist the secretary in distributing the time and in making up the pay-rolls. They were later found of considerable use in many specific instances. The second class of reports, and perhaps the most important, were those required from the inspectors on construction work. These reports were made fairly complete and covered not only the work done each day, but also such things as materials received, accidents, weather conditions, soil conditions, and force employed. The inspector was also required to note on each report any orders received by him either verbally or in writing. As argument-settlers these reports were without equals. These reports were supplemented by extra work reports and load reports. The extra work reports, I feel, were particularly interesting. Extra work is the "bugaboo" of construction work. It is safe to say that there is more damage done to perfectly good souls because of wrangling and prevarications over extra work than over anything else in which a city engineer is interested. We adopted drastic rules regarding extra work and then enforced them as drastically. No extra work was ever undertaken without a proper order. This order was made in triplicate, one copy going to the contractor, one to the inspector, and one being retained in the office. These orders were very explicit as to the work required. The orders were numbered continuously for each job and the inspectors were required to submit with their daily report an extra work report showing all labor and materials that entered into each piece of extra work in progress on his particular job. These reports were signed by the inspector and by the contractor. When the work was completed, the inspector returned with the last report his copy of the order. This informed the office that the particular item of extra work was completed. The cost was then computed and the amount included in the next partial estimate. With this system we had one argument over extra work in eight years. That argument was with an Italian contractor who rendered a bill for something over $700 for extra work covered by reports duly signed, showing a total of approximately $120. The contractor was paid $120 plus the usual 15 per cent and the "argument" was merely a one-sided lament.

Laboratory reports covering materials used on the work were also of uniform size with the other reports and were bound with the other data for final filing. With these reports and the other reports which I have described, it was possible on asphalt construction to trace a failure in any particular place in the street step by step to the plant and to the materials involved. We experienced some difficulty at first in securing reports from the inspectors at the proper time. This difficulty was overcome by notifying the inspectors that their pay-rolls would be made from their reports. This ended the trouble.

One point in which the records of an engineering office are woefully deficient, is a proper street record. Ordinarily, an engineering office can inform you where a sewer is located and can give you fairly complete "Y" locations. When it comes to the matter of street acceptances, street grades, street locations and street histories, it is entirely a different matter. After a mad search through the office the engineer will usually inform a citizen requesting any such information that it is not available. I believe that a street record as complete as the sewer records should be in every engineering office. Supplementing this street record should be a city map. This map, primarily devised for the city assessors, will be of more than passing use to the engineer. It will eliminate the need for about 90 per cent of the time-taking little survey jobs that raise havoc with the best-considered work schedule.

There is not much need to emphasize the sewer record. I do feel, however, that consid-

erable value could be added to these records by indicating thereon the depth of the sewer. This is a question that is continuously being asked and which under the present and usual state of the records requires a delving into such musty and dusty records as may have withstood the assaults of time. Another failing with sewer records is the failure to tie in manholes.

I will conclude with a brief reference to the office correspondence. Correspondence is of two general classes—important and unimportant. Unimportant correspondence, such as requests for catalogs, testimonials regarding patented pavements and the like, should be immediately filed in the waste basket—some of them, I feel, without even being read. Important correspondence derives importance from two sources—the information contained or the name and address of the sender. When a letter is of importance only as a reminder of the name and address of some person or company, the name and address should be recorded in a proper book and the letter destroyed. It is only by constant weeding that the bulk of a correspondence file will be kept within reason. Where all correspondence entering or leaving the office is carefully preserved, the inevitable result is that important letters of a few years back are either lost or inaccessibly filed back of the coal-bin in the basement. Correspondence should be filed in groups of 20 or 30 letters, arranged as nearly as may be in chronological order. The letters should be numbered continuously and two cards, or more if necessary, made for each letter. One of these cards should contain the name of the person writing or written to, the number of the letter, the date, and a very, very brief synopsis of the letter's contents. These cards should be filed alphabetically. The other card should contain similar information, but should be headed by, and filed under the subject covered by, that particular letter. These cards should also be filed alphabetically. When a letter covers more than one subject, a subject card should be placed in the file for each such subject. If these subject cards are well cross-referenced, the city engineer need never fear a lost letter, since it is possible to locate the letter either by subject or by name. This system has been criticised and condemned because of the time required for making out the cards. After eight years' experience with such a system, I am willing to risk my hope of immortality on the accuracy of the statement that the time required for making and filing the cards will be saved ten times over by the facility with which letters may be consulted.

In the preparation of this paper, I have kept in mind not only the city engineer, but also the men who are charged with his appointment and the men with whom he comes into contact. If I have succeeded even in a small measure in showing how the engineer's work fits into the general working of the city adminstration, I shall be happy and shall consider that this paper has not been entirely in vain.

Efficiency in Garbage Disposal

A Civic Consciousness as Well as a Competent Engineer Necessary for Efficient Garbage Disposal

IN the report of the Committee on Garbage and Refuse Disposal presented to the 11th Annual Convention of the Minnesota League of Municipalities by W. F. Bleifuss, Health Officer, Rochester, Minn., several facts regarding conditions in Minnesota which are applicable in many other states are brought our forcefully. A general survey carried out a year ago showed that the collection and disposal of municipal refuse was not satisfactory from the standpoint of efficiency, sanitation or civic pride. It was not efficient because the collection was never complete, though in some cases it was done with outward economy. It was not sanitary because inefficiency in waste disposal always means that sanitary requirements are ignored; and as far as civic pride was concerned, no community was taking any pride in its rubbish heap. The survey showed that most cities were using dumps for all or part of their refuse. Garbage was usually collected haphazard by private collectors or disposed of individually. Several municipalities were using incinerators, others were filling in low lands with ashes and rubbish collected from the city. Very few communities were satisfied with their own solution of the collection and disposal problem, and most city officials were looking for something better.

Some cities evidently were displaying considerable ingenuity in hiding their refuse piles, but it is getting to be a difficult matter to hide anything from the traveling public. "A civic consciousness" that would make a dump at the door of a city as objectionable as though it were at one's private door seems to be needed. City officials keenly feel the lack of system in this form of municipal house-cleaning, but the

general public seems to be indifferent. Probably the matter should be approached not from the public health angle, but from that of civic pride. The better individuals of our communities do not so handle the refuse question as far as their own homes are concerned, but perhaps more should be done to emphasize the inconsistency of permitting their municipalities to do so. Good ordinances covering refuse disposal are sadly lacking, or at least they are not effective because they not enforced. It is questionable whether a model ordinance would help, because local conditions differ and each community has a problem of its own.

The general management of this situation should be placed in the hands of the city engineer. It is a problem for engineers and police departments more than for boards of health. This leaves the health officer more time for things that really count in the prevention of disease. If the municipal health department's time is mainly taken up with matters which come under the general head of "nuisances," the department is fighting disease with a blunderbuss instead of a rifle. A study of progress in public health during the last quarter of a century will show that this statement is correct. From a public-health point of view, the important thing in refuse collection and disposal is to prevent flies from gaining access to such material as is suitable for fly-breeding. Garbage alone does not "breed" disease germs—it can't cause sickness except by helping to propagate flies. Even flies cannot cause disease unless they are permitted access to discharges from the human body.

Municipal house-cleaning—literally—is being neglected. This is one reason why so many of our municipalities are not more attractive than they are. Some American city has yet to evolve a plan, and put it into operation, that will give general satisfaction for the disposal of all kinds of waste.

How to Improve Garbage Disposal

Create a civic interest on the part of the taxpayers.

Put the management in the hands of the city engineer.

Carefully study the advantages of the different methods of disposal and don't jump at conclusions. Employ a competent, experienced consulting engineer to design and superintend the construction and operation of the disposal plant.

Disposal by Incineration

Incineration is to complete destruction of waste by burning. It has three distinct advantages: (1) single cans for houses, making it easier for the housewife in that there is no sorting, and this means complete collection of all refuse; (2) reduced cost of collection because an incinerator can be centrally located; (3) it is thoroughly sanitary because it destroys all organic or germ life.

There are not many disadvantages in incineration. The best plants have a fairly high initial cost and a little uncertainty as to how the plant will operate under all conditions. Also, if not operated properly, there is some chance of escape of offensive odors from the smoke-stack. Except in large cities, there is little or no opportunity for profit from the sale of by-products. Since garbage has a high food value, incineration of this form of municipal refuse means a total loss as far as food conservation is concerned.

In a study of incinerators in general, the Minnesota Committee has been impressed with the fact that not everybody can design and construct a successful incinerator. Anybody can burn rubbish, but to design an incinerator that will burn all rubbish, from dead animals to wet garbage, and that is just suited to the needs of the municipality, is a difficult thing to do. The wise city engineer usually will be glad to call in a consultant, and this consultant should be one who has had experience in constructing just such a plant.

The fact that an incinerator totally destroys all refuse, leaving practically nothing but ashes, nothing to cause offense which will make Mr. Citizen rush to the Board of Health to complain of a nuisance, is much in its favor. It does not have to be put up in a lonely, distant spot or hidden from sight. It is possible to construct it so that it may be pointed out to sightseers as one of the attractions of the city. Some municipalities have made their incinerators very attractive by covering them with ivy, as though they were libraries or churches.

To burn refuse, it is necessary to have a hot fire with a temperature of over 1200 degrees. The fuel is not coal. Some waste, such as garbage, contains much water. When dried, however, it has considerable calorific or heating value, which is equal to about one-half that of coal. Even ashes contain as much as 25 per cent of unconsumed coal, rubbish is 95 per cent combustible, and street sweepings contain 25 per cent of combustible matter. From this, it is seen that there is plenty of material in mixed refuse to furnish combustion. It will burn if the moisture is first

driven off. Incinerators, of course, are constructed to dry the wet refuse first before any attempt is made at combustion. A good incinerator burning ordinary mixed refuse requires little or no extra fuel, as the readily combustible rubbish will provide the heat.

Municipal refuse is not the same for all localities. Here there is a certain proportion of garbage, for instance, and there another proportion. The failure of incinerators to operate successfully is due to faulty design, which causes incomplete burning. Many incinerators throughout the country have been built and operated for a time and then abandoned. Sometimes, it is true, they were abandoned for no other reason than that there was a change in the city's administration, but usually it has been because of some fault of construction or operation. They did not fit the incinerators to the town, but built an incinerator and then tried to fit the town's refuse to it.

A well-known engineer has said that it is perfectly possible to cremate all refuse, providing a proper study is made of design and operation. He advised specifications for construction, the same as for other municipal works, with complete instructions to bidders as to just what the requirements and conditions are. No municipality should think of constructing an incinerator without first making a study of the whole situation; it should know how many tons of refuse it has per day to be disposed of, what the composition of the refuse is, the percentage of moisture and the percentage of combustible matter. The firm building the incinerator should guarantee the proper operation of its design both for efficiency and economy.

Know Your Mains and Valves

Abstract of a Report of the Committee on Fire Prevention and Engineering Standards of the National Board of Fire Underwriters

ONE of the most interesting passages in a recent report of the Committee on Fire Prevention and Engineering Standards of the National Board of Fire Underwriters describes broadly the conduct and results of engineering surveys of municipal water-works. These surveys are conducted from time to time in different cities to determine the grading of cities for fire insurance and are particularly helpful to municipal officials in unearthing conditions which have not been noted by the officials of the department responsible for them.

"In the course of the investigation of water-supply and distribution in different cities, the National Board's engineers frequently uncover conditions which were unknown to the local authorities. It was found in a certain Michigan city, for example, that the hydrants on one side of the main business street gave forth a copious supply of water, whereas on the other side the flow was deficient. An inspection disclosed the fact that the sub-normal hydrants were connected to a main on which the gate-valves opened in a direction opposite to that usually employed, and had been tightly closed when they were supposed to be open. The water department had no record of this condition, and the result of the discovery was an ample supply of water at good pressure from all the hydrants in the mercantile district.

"Fire-flow tests are conducted at various points in a city, a number of hydrants being opened simultaneously so as to counterfeit the conditions that prevail during a large fire. Instruments are used, of course, to determine the actual flow of water. The result of such a test has often convinced city officials of the inadequacy of the local water-supply.

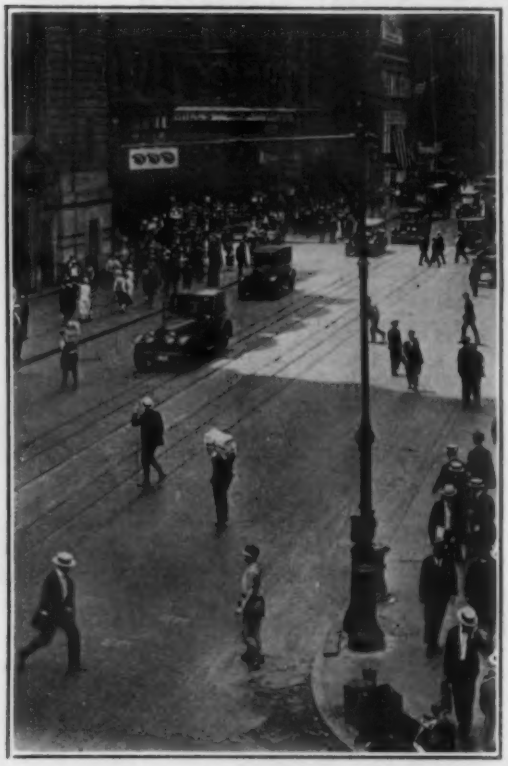
"A brief review of the developments of recent years that have affected the whole problem of fire control will be of interest. During the two war years, 1917 and 1918, and in some cases during the two succeeding years, there was a decided falling off in fire protection improvements in all of the city departments having to do with this important function of municipal work. Even maintenance work and the ordinary extensions stopped or were greatly curtailed in the water-works field.

"Beginning with 1922, officials of the water departments began to realize that there was little immediate prospect of a decrease in cost of materials or of labor and that therefore plans must be made for the immediate needs of the city, to take care of the future. In a large number of instances, operating costs had increased to such an extent that no funds were available and bond issues or increase in water-rates had to be adopted. The year 1923 has shown an increase in the amount of work. Certain cities, such as Akron, Detroit, Bridgeport, New York, Los Angeles and some of the smaller industrial centers, were forced even during the war years to undertake a large amount of work, and these cities and others are now completing or have already completed very extensive improvements."

New Traffic Control System on Broadway

THE first installation of considerable size employing the suspended type of traffic signals is helping to solve the congestion problem of Broadway, New York, from Rector Street to 86th Street. Structures like those in Fifth Avenue could not be used. Instead, it was necessary to suspend the lights on ornamental brackets on poles along the curb, 6 feet out from the curb and 24 feet above ground.

The control lights are visible for several blocks, even in bright daylight. The units, with their red, amber and green lights, are placed at intervals of four or five blocks in the down-town section, and eight to ten blocks in the up-town section. The installation in-



TRAFFIC CONTROL SIGNAL AT BROADWAY AND VESEY STREET, NEW YORK CITY

cludes 21 two-way and 6 single-way units; the single-way units are used on the north and south sides of the elevated structures.

Traffic movement can be synchronized, or each signal can be operated independently, thus giving right of way to meet emergency conditions. Traffic in Broadway moves a minute and a half; cross-town traffic 40 seconds. Vehicles in cross-town streets govern themselves by the traffic in Broadway, the lights not being visible in those thoroughfares.

SPECIAL BRACKET TYPE TRAFFIC SIGNAL USED AT UNION SQUARE, NEW YORK CITY

All of the signals are used through the day, but after 6:30 p. m. only the section between 23rd and 86th Streets is included in the operation of the system.

The signals are made of heavy copper stock, with visors above the lenses to cut out the direct rays of the sun. The glass reflectors are silver-plated and protected by a flashing of copper, thus insuring long life to the reflecting surface. Behind each lens there is a 50-watt, 110-volt mill type filament incandescent lamp.

The order for these special traffic signals was placed with the General Electric Company three weeks before the Democratic Convention opened. Exceptionally heavy traffic was expected at that time, and the order was given right of way at the Lynn works of the company. The signals were delivered two days before the convention opened. They are proving their worth both for emergency and ordinary traffic conditions.

City Manager Charters Analyzed

Part I: Historical Background—Variations in Plan—Legislative Body—Proportional Representation—Qualifications for Councilman—Mayor

By Wylie Kilpatrick

Director, Hoboken Bureau of Municipal Research

THE city manager form of government completed its first eleven years of history on January 1, 1924. Eleven years previous, Sumter, S. C., the first city to inaugurate the manager form, began operation under a charter adopted in 1912. Staunton, Va., it is true, began operation under a "near manager" plan in 1908. By a local ordinance of that year Staunton created a managerial position which she superimposed upon the mayor-and-council form prescribed by the Virginia constitution. The Dayton charter, ratified August 12, 1913, went into effect the first of the following year. The pronounced success of the managerial plan in Dayton came at a time when enthusiasm for commission government had suffered from various failures in practice, and cities desirous of altering their charters watched the Ohio city with interest.

The charters of the city manager municipalities throughout the United States have in the main been modeled on the early experiments. Eleven years' growth in the movement, however, has thrown up variation in the plan; adaptations have been made to local conditions; twists have been made necessary by state laws.

A Study of 166 Charters

To take stock of the city manager plan as expressed by the charters of the manager cities has been the object of an exhaustive analysis by Dr. Robert T. Crane, Director of the Bureau of Government of the University of Michigan.[1] The framework of 166 municipalities is minutely analyzed in his digest of manager charters, which limits its scope to an examination of charters and omits ordinances which establish the managerial form. For the data upon which this article is based the writer is indebted primarily to Dr. Crane.

[1] **Digest of City Manager Charters ($5.00). National Municipal League, 261 Broadway, New York City.**

Historical Background

The assumption is commonly made that the city manager plan is a direct outgrowth of the commission form of government. The very frequency of the use of the term "commission-manager" implies that the manager has been merely grafted upon the commission so that the resulting hybrid is but a judicious mixture of plans. In fact, certain essentials of the manager form strike back historically to the earliest forms of municipal government in America. Complete centralization of executive and legislative power in the city council —an essential of both the manager and commission forms—marked the structure of colonial municipalities.

The democratic origin of the practice of separating the powers of a city government, or rather the Jacksonian interpretation of democracy, should be fully understood to-day. It stands in the way of the full acceptance of a workable plan to ensure democratic control of city officials and is responsible for many of the curious twists to which present-day machinery of local government is subjected. Although the framers of the Federal Constitution thoroughly exploited the dogma of the triune nature of government in 1787, the theory was not accepted by municipalities until the Jacksonian fervor for popular sovereignty toppled over the practice of centralizing power in a legislative body which was responsible for administration through selected agents.

The mayor was the first to be cut off by a popular election from the control of the council. Complete separation of powers was accomplished by making the various heads of the city subject neither to the mayor nor to the council but to popular control. The long ballot of the city resulted from the belief that the number of officers elected by the people was an accurate measure of the extent of democracy; it did not result from a deliberate decision that a sharp distinction should be made between legislative and executive functions.

The gross mismanagement which marked American cities fifty years ago did not suggest a return to centralization of power to the framers of city charters. Rather, one execu-

tive, the mayor, as a substitute for many popularly elected administrative heads, was resorted to by many cities. Here, then, we find a development which necessarily preceded the city manager plan. The strong mayor type did this important thing: it acknowledged the natural division between policy-making and policy-executing functions and it centralized to a large extent in one administrator the responsibility of execution. It is true that this distinction was hardly ever drawn accurately, for the mayor was frequently given a degree of legislative power. Yet the distinction did exist in the rough and prepared the way for its more precise definition by the manager plan.

The city manager form, based as it is on the theory of the colonial type that executive and legislative responsibility must be centered in the council, avoids the error of the commission plan in requiring legislators to perform the detailed administrative work of an executive. A dual requirement emerges: centralize power and responsibility and distinguish between policy-forming and policy-executing functions. These seemingly conflict and an impasse is reached until the manager form recognizes that all policy-making functions can be centralized in a popularly chosen council to which a single administrator is responsible for policy execution.

The managerial plan is indebted to commission government for recalling to American practice the historical basis of centralizing responsibility in the council; it is equally indebted to the strong-mayor type for proving the value of a single-headed administrator. It avoids the error of the former by distinguishing between policy-making and policy-executing duties; it eliminates the mistake of the latter by placing executive responsibility in the council, and administrative execution in a manager accountable to that body.

Variations in Plan

An examination of present-day city charters reveals to how great a degree the managerial conception has found acceptance and to how large an extent it has been distorted in modified plans of hybrid forms of local government. The ordinance-created manager (eliminated from consideration in the Digest) is a common method by which the manager plan is distorted. Though it may establish a genuine city manager form and lack only the sanction of a charter, it often is merely a hybrid. The "gland operation" is accomplished by imposing the managerial office upon a federal or commission structure. The manager of this type in many instances has gone out the same way he entered—by ordinance.

Dr. Crane's digest is in the main confined to genuine city manager plans in which the council holds a single officer accountable for the city's administration. Yet the inclusion of a number of doubtful cases where some fundamental principle is lacking makes it necessary to distinguish between the genuine and modified types of the plan. Diffusion of administrative responsibility, the subjection of the manager to popular recall, and possibly the omission of the popular checks through the initiative, referendum, and recall, are various perversions of the plan found in some municipalities.

Legislative Body

A council and not a commission is the legislative body of the city manager plan. It has complete legislative and executive responsibility, exercising its legislative powers directly as a deliberative body and its executive functions indirectly through an appointed manager. A commission, strictly speaking, is composed of a group of administrators who periodically assume legislative duties when joint action is desirable. The hybrid term "commission-manager" is entirely misleading, for to create a city manager is to make impossible the functioning of a commission. The absurdity of confusing or coupling the manager and commission plans is apparent when we attempt to join these terms which neutralize each other. Though occasionally the representative body is named "board of aldermen," "board of trustees" or "directors," the words "council" and "commission" are used in 141 of the cities. Commission is the title in 73, a number slightly in excess of the term "council," found in 68 charters. It is apparent that the word "council" is increasingly employed, for of the 42 cities adopting manager charters in 1921 and 1922, 25 designated their legislative body as a council.

Larger councils are provided in charters lately adopted. With the growing realization that the council is a deliberative body and not a group of administrators, the norm of the commission plan—a group of five—is being abandoned. The size of the group in the commission plan is gaged by the number of administrators; the size of the managerial council corresponds to the local needs for a deliberate body of legislators. The effect of the commission type is still pronounced, for in more than half of the 167 charters five councilmen are provided. An even smaller number, three, is found in nearly a fourth of

the charters. The growth of the larger chamber, however, is shown by the fall in the percentage of councils with five members or less, from 100 per cent in 1913 to 78 per cent in 1922.

Non-partisan nomination of councilmen and their election at large is the usual procedure, although there is a surprising number of cities which retain the partisan nomination or some feature of ward residence as a qualification for the council. Nomination through a non-partisan primary or petition is provided in 103 charters. Although a confusing variety of election methods prevail, the principle of election at large is accepted in 126 cities. Only 37 charters require a ward or district residence as a qualification for a councilman; 19 of this number require the nomination to come from the district, and nearly all of this number, 15, add ward election to the nomination qualifications.

Methods of election affecting the personnel of the council are recognized as having an important reaction, if not a deciding influence, upon the administrative service. The council must continue to control the character of the administration, not by directing subordinates but by acting upon the manager. Colonel Roosevelt in the heat of a campaign once said of his opponent: "He means well but he means well feebly, and he is surrounded by men who neither mean well nor are feeble." If a group of strong, self-willed politicians compose the council, non-partisan administration will be jeopardized; if a manager whose tenure is necessarily dependent upon the pleasure of the council gives way before aggressive partisanship, a political ring can as effectually control administration as in any other form of government.

Admittedly, the particular mode of election —whether by ward, at large, or by another device—is not fundamental to the manager plan. But the trend in practice can be readily discerned, and possibly the next step can be forecast. The city ward was discarded by most of the charter-framers as an unnatural political unit. It represents nothing more than the "sleeping-quarters" of a particular group whose vital interests may be, and often are, elsewhere in the city. Whatever may be claimed or denied for selection at large, it does eliminate gerrymandering, aptly defined as the art of arranging the lines of districts so that a majority party elects only a minority of legislators.

Proportional Representation

Other measures are now being tried to eliminate the dextrous log-roller and his pork barrel. For, too frequently a city under the election-at-large method finds that instead of "seeing the mind of the city in the council in miniature, it really sees it in caricature." The preferential ballot has been adopted in fourteen cities, though the use of it is decreasing.[2] Of more significance, however, has been the introduction of proportional representation into the charters of Cleveland and Ashtabula, Ohio, and Boulder, Colo. Representation of powerful minorities on the council, made possible by this mode of election, is possibly the best safeguard against an extra-legal machine willing or anxious to emasculate the manager plan. Even a temporary reaction which gives the old-line candidates a bare majority will not be serious when the council contains a strong minority watching every move of the controlling faction.

No experiment in governmental machinery will be watched more closely during the next few years than the operation of proportional representation in Cleveland. The character of the legislative body has been one of the chief obstacles in the past to the introduction of the manager plan into the larger American cities. The customary-sized council of five can not be truly representative of a huge city. To increase the number appreciably would destroy the high visibility of the short ballot and substitute one as long as a wet blanket. Reversion to the ward system, even though it would avoid the confusing long ballot, is unthinkable after its admitted failure. Chester C. Maxey points out that both the long ballot and the ward system are obviated by the Cleveland method of proportional representation. If, in fact, the recently elected council of twenty-five in Cleveland proves to be a body honestly representative and non-partisan, a most powerful stimulus will be given to the adoption of the manager plan in the major American cities.

Qualifications for Councilmen

The conception of the council as a deliberative legislative body and not an administrative group, is reflected in the qualifications and salaries specified in the charters examined. No salary, or the nominal one of a dollar a year, is the compensation fixed for members of the city council in 34 cities. Although salaries of $1,200 are frequently paid, the weighted average per year is $200 dollars.

[2] Alameda, Calif.; Santa Barbara, Calif.; Colorado Springs, Colo.; Grand Junction, Colo.; Decatur, Ga.; Alpena, Mich.; Big Rapids, Mich.; Cadillac, Mich.; Manistee, Mich.; Sault Ste. Marie, Mich.; Morris, Minn.; Mangum, Okla.; Le Grande, Ore.; Tyler, Texas.

The charters of 43 cities, it should be noted, fix the compensation according to the number of council meetings attended.

Qualifications for councilmen as to age and residence, hardly significant in themselves, differ widely. Any financial interest in city administration which may prejudice the conduct of a councilman is guarded against by various forms of disqualification. One, an interest in municipal contracts, is contained in nearly all the charters. Dr. Crane concludes: "The total lack of anything approaching to a consensus of opinion on most of the tests justifies the conclusion that the right to vote in the locality is a democratic and sound and sufficient qualification for members of the council."

Mayor

What position does the mayor assume under the manager charters? Caught between the upper- and nether-stones of executive responsibility of the council and administrative direction of the manager, his powers and title are anomalous. Primarily, he is the presiding officer of the council. One hundred and forty-six charters cast him in this role. Although the presiding officer, he is given a vote, in all charters, with the exception of Bay City, Mich. The denial of the veto power comes as a natural consequence. The mayor retains the emergency powers which have historically been given his office. In an emergency, as a riot, he assumes the powers of a sheriff and takes over the direction of the police. Although this power is specifically granted in only 49 charters, it is a common law prerogative of the mayor which is not withdrawn by lack of expression in the other charters.

That the exact status of the mayor remains somewhat unclarified is indicated by the mode of his selection. The hereditary conception of the mayor as a direct representative of the people continues in 50 cities which provide for direct popular election. The more common method, prevailing in 98 municipalities, is that the council shall choose the mayor from among its own members. An additional seven specify that the mayor shall be the candidate for the council receiving the largest vote. Significantly, the majority of the charters refer to the mayor in terms that imply that the traditional idea of his office has not been abandoned. He is named as the official head of the city by fourteen charters, chief executive by thirteen, and ceremonial head by one charter. These references may be interpreted either as a hang-over of an obsolete idea, or as the retention of a fundamental idea which will find more adequate expression in later charters. Dr. Luther Gulick, commenting upon this aspect of the manager plan, said:

"It is human nature for voters to demand some one individual to stand up as their political leader and public educator on matters of municipal concern. There must be some one man in the community who not only can talk for the public, but can help them see their way out of the morass."

City manager charters indicate that this criticism has been unconsciously felt and that charter makers are sensing the need for political leadership. Both the number of popularly elected mayors and the recurrence of references to the mayor as the head of the city lead to the conclusion that the people desire a chief officer directly responsible to them. Possibly, the development of the manager plan in the next decade will throw up the mechanism to meet this need. If the current conception that the mayor is essentially a moderator of the council is to prevail, the American city will contribute a counterpart to that sinecure of national life, the Vice-President. The mayor will then second the frank confession of Thomas R. Marshall: "I hate to work. I wouldn't work if I didn't have to. I hate to work so much I'd like to be Vice-President again."

(*To be concluded in the November number*)

Americanization Through Community Music

HERE is the personnel of a community band in Luzerne County, Pennsylvania: Peter Muscovitch, Herman Bressler, John Fetchko, Philip Galdon, Henry Houser, Stephen Cimbala, Andrew Yanchko, Joseph Washko, Max Rossi, Stephen Fulton, Michael Prokop, Elsworth Minnich, Albert Toreson, Frank Sheminsky, Neil Organ, Joseph Yamulla, Andrew Puhak, Frank Dushanko, Howard Spade, Bernard Lapinski, James McElwain, Elmer Gardner, James Hall, Frank Cervasio, John Tychinski, David Renshaw, Joseph Cortese, Morton Baskin, Michael Burchak, Thomas Arey, Vincent Boyle, William Crabtree, John Sellers, Michael Danay, Leo Moore, David Zillig, George Haswell, Adam Sabatella, Wassil Smerekanich, Adolph Sheminsky, Stephen Fekety, George Yurick, James Angelo, George Rusnock.

"A Friend of the Editor," who sends this list to the *Journal of Education*, writes: "Is Americanization work being done? It surely is, and best by those who talk least about it, but who do it without any formal and forbidding courses. The above is the personnel of a band in a Luzerne County, Pennsylvania, High School. The foreign proportion runs about the same through the community, yet it is a safe bet that pure, disinterested patriotism and real unpaid Americanism is just as high there as it is in the United States Senate—but there isn't as much noise and flag-waving—or job-grabbing—about it."

ONE OF THE COMMUNITY PLAYGROUNDS IN THE COUNTRY CLUB DISTRICT, KANSAS CITY

Suburban Subdivisions with Community Features

Suggestions for Realtors and Community Organizations, as Exemplified in the Country Club District of Kansas City, Mo.

By J. C. Nichols

DEVELOPING suburban subdivisions with community features is a subject of constantly increasing importance to the real estate profession. Community features may be largely instrumental in first attracting the attention of the buying public to a subdivision. They may be the factors that largely create sales in the beginning. Community features can be the means of giving character and distinction to suburban property; the things that create enthusiasm for the property by its residents; the things that cause the tenants and owners in the property to enjoy living there.

Recreation for the Community

An annual community field day—bringing together all the school children in the district—can be made inexpensive and very effective. For several years we have held such events in the Country Club District of Kansas City, largely underwriting the expenses of the meet. In May of this year we had approximately 3,000 school children on the campus of one of our private schools. Eleven schools, public and private, some of which reach only partly into our district, joined in the meet. An executive committee was composed of a representative of each school. All the events were carefully worked out in advance—each school having its own individual feature event, and also entering representatives in the general events.

And then again we have our hikes into the country—perhaps a "wienie" roast for the boys of a certain school. We may get a lover of birds to lead the boys, a geologist, or someone interested in the early history of the territory to make the trip interesting. Trails for hikes may be provided, particularly if you have an interesting country around. And the more adventuresome these trails become, the more interest they have for the grown person or child that loves to walk in the woods. We built six picnic ovens at various points along the trail, which are used morning, noon and night by those who love the outdoors and enjoy a meal in the open, cooked over the picnic fire.

Other recreational and cultural features include a supervised playground; a community hall, where neighborhood dancing lessons, lectures and community events may be held; neighborhood flower shows; community Christmas trees, and the singing of Christmas carols as a community activity; the encouragement of horseback riding and of bicycle clubs; and an organization of boys to keep the snow swept from ponds or streams for skating in the winter.

We have four golf clubs in the Country Club District. Three of them we have built as an adjunct to our real estate development, organizing, financing and developing the club from the beginning. In two of these organizations it is stipulated that no one can become a

member unless an owner of property in our subdivisions. We generally provide a site for the course without any charge, on our unsold acreage in the beginning. We start the dues at, say, $30 or $40 a year, with no initiation; provide no club house, simply a little room for golf headquarters; and start out with 9 holes, adding others as the club grows. We may have only 50 or 60 members to start on, but as interest grows and the membership increases, we have found from experience that an honor to be elected. An annual meeting is held of all the owners and the policy is prescribed, which the directors carry out.

Snows are cheaply plowed from the streets and walks, at a cost of only a few cents to every 50-foot lot. Street trees are sprayed and trimmed at a far less cost than the individual could do it, even if he would; and we know from experience, that if left to the individual owner, his street trees are generally neglected. Vacant property is kept cleaned and mowed as a community expense; shrubbery, flowers and ornaments in all public places are maintained; street trees are replaced when necessary; trash is hauled away at community expense once a month from each home. This waste-removal service alone would

GASOLINE FILLING STATION

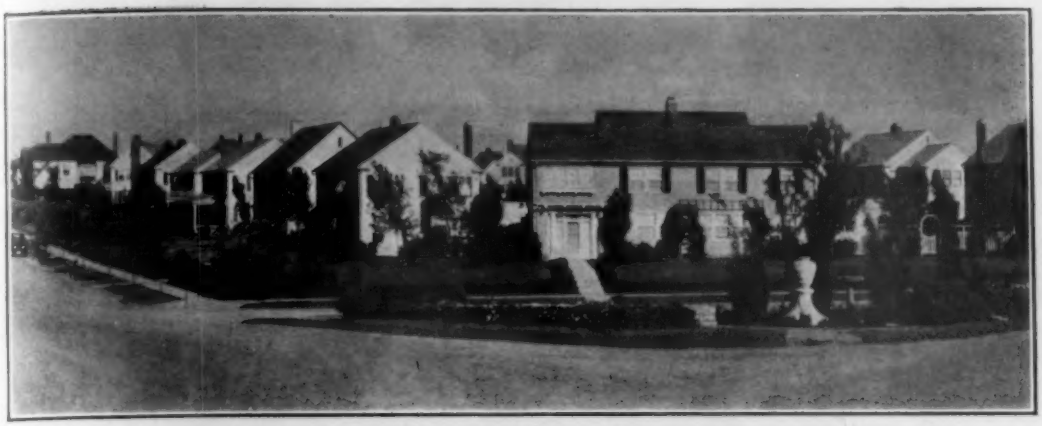
COMBINED FIRE AND POLICE STATION

within three or four years we shall have 300 or 400 members in our club. When it has grown to a strong membership, a club generally begins establishing a sinking fund for the purchasing of its own real estate for a permanent course and the erection of a complete club house. These organizations have been able to reimburse us for the amount of money we advanced during the early period, and their value to us has been well worth the giving of the ground without rent during the formation years.

Community Homes Association

In every subdivision we have developed for many years, we have stipulated that the owner of each lot be obligated to pay not to exceed a mill per square foot per annum towards the organization and maintenance of a community homes association. This tax rests upon all unsold as well as sold sites. It is a tax on land, and not on improvements. Only residents can serve as directors, and without salary. It is otherwise cost the individual owner more than his entire expense of the community homes company assessment.

The directors of this homes association are also charged with the responsibility of enforcing restrictions—and have the funds to go to court, if necessary. They take over the control of any playgrounds, fountains, picnic ovens, or other community features. They become a united, powerful organization to present any cause to municipal authorities, or to any public utility. They develop a strong community feeling, a neighborhood pride and a betterment of the physical condition as well as the community spirit of the entire section.



A GROUP OF HOUSES IN THE COUNTRY CLUB DISTRICT

Architectural Standards

Stores and shops in a real estate subdivision should be of good architecture, not offensive to the surrounding home owners. All loading and unloading of trucks should be confined to courts in the rear. No overhanging signs or big lettered posters should be permitted. No ugly or filthy rear ends should be tolerated. Filling stations can be made unobjectionable, if proper control of design, color and maintenance is retained.

The design and location of the fire and police station is important and should be made inoffensive. Of course the location of schools, with ample playgrounds, and the distribution of churches and structures needed to meet community needs, are important factors in community development.

Another important factor is the giving of character and distinction to certain neighborhoods and certain streets by a particular type of development. This may be done by the grouping of buildings of harmonious architecture; by a pleasing blending of the colors of the roofs of near-by houses; by the careful graduating of grade and floor elevation of one house with another; by the avoiding of the overshadowing of low houses by tall ones. Much charm in a residence neighborhood may come from the placing of interesting gateways at street intersections, but this is frequently abused in making the gateways the predominant thing, rather than incidental and subordinate to the streets and lawns themselves.

The curving of the streets, the placing of the trees, the planting of the shrubs, the walk design, and the various street furnishings may all be so arranged as to give a variety of character to various parts of a subdivision. Frequent triangular parks at street intersections give a cosy, domestic character to a residential street. They relieve monotony, they break the sweep of winds, they relieve the hot glare of a straight stretch of paving, they give ever-changing color and create a street scene of value to the entire neighborhood.

And then the realtor or the community association may go further and introduce certain ornamental features of good design and taste, appropriate to public sites. It may be

STREET-CAR SHELTER

BUSINESS DEVELOPMENT

TREATMENT OF STREET INTERSECTIONS

an interesting piece of statuary of real value and character, or a good reproduction obtainable in terra cotta and other factories. It may be a beautiful vase placed in an open park. It may be an interesting iron gate at an appropriate place; or it may be a fountain of local design or gathered from the markets of the Old World where such an abundant offering is obtainable.

The Opportunity of the Realtor

In the development of community features there is a great opportunity for the realtor. He is the man who creates and fixes the appearances of a city. It would be foolish for idealism to carry beyond the things that would pay. But as the realtor develops his properties and as the public appreciation will justify it, better and better community features may be successfully added. The community spirit will reflect itself in the architectural design of every home, in the garden side as well as the street side of the lawn, in the interior arrangement; hangings, paintings, and furniture of the owners, and in the mental attitude and spiritual attitude of the residents themselves.

Children will become interested. They will develop an art appreciation in the broad sense. They will become observant of the beauty of this great world around us. They will see greater beauties in the sunset, in the distant haze-covered hills. They will get a greater joy in the budding of the forest trees in the spring. They will be more thrilled by the singing of the birds in the early morn in the trees around their homes. They will gain an understanding of the miracle of the opening flower in the joyous springtime. They will learn to abhor ugliness and prize beauty. They will learn the value of good design in every physical object that exists. They will appreciate color harmony in our schools and homes, the streets and the public buildings. Their eyes will be lifted beyond the more sordid things in everyday existence, and they will begin to dream dreams for the future achievement and beauty of their city.

How Cities Use Their Land

THE following table appears as an appendix to "Elements of Land Economics," by Richard T. Ely and Edward W. Morehouse, recently published by the Macmillan Company, New York. A foot-note states that the table has been compiled by H. B. Dorau, of the Institute for Research in Land Economics and Public Utilities, from returns from questionnaires sent to various city officials; and that these figures represent the best estimates available, but, although they have been carefully edited, they cannot be guaranteed as absolutely accurate.

PER CENT OF TOTAL LAND AREA DEVOTED TO VARIOUS CLASSES OF USES IN SIXTEEN CITIES, 1923

	Publicly Utilized Area				Privately Owned Area				
					Unimproved	Improved			
	Total	Streets and Alleys	Parks	Miscel.	Total	Total	Residential	Commercial	Industrial
Columbus, Ohio	36.1	27.0	2.0	7.1	3.3	60.6	32.9	12.1	15.6
Davenport, Iowa	18.7	14.5	3.7	.5	36.8	44.5	42.7	1.2	.6
Detroit, Mich	30.0	25.0	4.0	1.0	14.0	56.0	33.5	4.5	18.0
Duluth, Minn	32.9	26.9	5.0	1.0	64.1	3.0	1.8	.2	1.0
Flint, Mich	22.4	16.5	2.3	3.6	21.3	56.3	52.8	.5	3.0
Knoxville, Tenn	22.8	21.1	.9	.8	17.7	59.5	48.5	1.9	9.1
Lynchburg, Va	18.7	13.2	2.8	2.7	13.5	67.8	50.8	10.2	6.8
Minneapolis, Minn	32.3	20.3	10.9	1.1	22.8	44.9	36.3	1.5	7.1
Norfolk, Va.†	36.2	23.3	2.4	10.5	9.5	54.3	33.4	2.5	18.4
Oak Park, Ill	34.3	32.5	1.4	.4	9.2	56.5	49.8	6.5	.2
Portland, Ore	25.1	20.8	2.7	1.6	18.7	56.2	42.1	5.6	8.5
Salt Lake City, Utah	28.2	16.7	3.1	8.4	33.4	38.4	36.6	.5	1.3
San Francisco, Calif	35.1	22.3	6.2	6.6	26.7	38.2	32.7	3.3	2.2
St. Paul, Minn	25.7	20.3	3.0	2.4	41.1	33.2	26.1	1.3	5.8
Toledo, Ohio	28.6	19.2	5.4	4.0	22.3	49.1	27.3	1.7	20.1
Tulsa, Okla	23.9	22.0	1.9	*	8.0	68.1	56.3	8.0	3.8

*Extensive parks and other public lands outside city limits.

†Excluding 7,500 acres recently annexed but undeveloped as to streets, parks, etc.

Standardized Empowering Ordinance for Highway Traffic Regulation

Suggested by William Phelps Eno

Chairman of the Board, Eno Foundation for Highway Traffic Regulation

An Ordinance[1] *for the Regulation of Highway Traffic in the City*[2] *of* .....

Be it ordained by the city of .....:

DEFINITIONS—That when used in this ordinance:

(a) The term "mayor" means the Mayor of the city of .....;

(b) The term "general regulations" means the C. N. D. (Council of National Defense) Code which at the time of its promulgation was officially designated as "The General Highway Traffic Regulations with Safety Directions for Drivers and Pedestrians,"[3] and which was adopted for standardization as a police code by the Council of National Defense, May 8, 1919, and revised to March 15, 1924;

(c) The term "special regulations" means those regulations which, in addition to the general regulations, are necessary to facilitate and expedite the safe movement of vehicles and pedestrians on the highways by the use of traffic officers and traffic guides;

(d) The term "traffic guides" means signs, limit lines, standards, "mushrooms," "turtle-backs," dummy cops, traffic "beacons" and "lighthouses," semaphores, "crow's-nests," traffic regulation lights, reflecting signals, sirens and such other devices as may be of assistance in the regulation of vehicular or pedestrian traffic.

SEC. 1.—That the Mayor acting through the Police Department of the city of ..... is authorized and directed to adopt and enforce the general regulations (with duly authorized revisions from time to time) and to cause them to be printed in a 4-page folder with pages 4 by 6 inches, on durable bright yellow paper, and also on a heavy yellow cardboard placard, setting forth all the provisions of the general regulations and no other printed matter.

SEC. 2.—That the Mayor shall provide that each uniformed member of the ..... police force shall, when going on duty, have in his possession at least five copies of the general regulations, in folder form. Such member shall give one of such copies to any person violating any provision of the general regulations, marking on such copy the provision violated.

SEC. 3.—That the Mayor shall make effective arrangements for the furnishing of copies of the general regulations to any person on application to the Police Department and for the furnishing of copies of such regulations to every pupil and teacher in the public schools of the city of .....

SEC. 4.—That the Mayor shall cause the general regulations in placard form to be displayed at police headquarters, fire stations, public schools and garages, gasoline stations and in or on other available public buildings, or on standards, on the highways, in squares and parks, in such manner as to inform the public, including pedestrians, of the provisions of the regulations.

SEC. 5.—That the School Board of the city of ..... shall by order of the Mayor provide for instructing the pupils of the public schools in the provisions of the general regulations and for such examinations and drills at such times and places as will cause such pupils to become thoroughly familiar with the provisions thereof.

SEC. 6.—That the Mayor is authorized to create a bureau in the Police Department to be known as the Traffic Bureau, which shall be in charge of a special officer who shall be known as the Traffic Director of the city of ....., and who shall not be under orders of, or responsible to, any officer below the rank of Chief of Police. All members of such bureau, or other members of the police force when detailed on traffic duty, shall be under the control and direction of the Traffic Director. Such bureau shall have control, subject to the approval of the Mayor, of the making and enforcing of "special regulations" in regard to moving and standing vehicles and pedestrians on the highways, and shall keep a record of accidents for the purpose of fixing blame and ascertaining cause, with a view to devising prevention.

SEC. 7.—That the Mayor may in his discretion cause to be compiled, printed and issued a small

Comments Are Invited

As a step in the direction of much-needed standardization, The American City is glad to have the privilege of giving first publicity to the accompanying draft of a proposed Empowering Ordinance for Highway Traffic Regulation, just completed by one of the world's leading authorities on street traffic control.

Comments, or suggestions for possible improvements in the ordinance, for publication in future issues, will be welcomed.

[1] Some cities already have ordinances or provisions of their city charters sufficient to empower their mayors or police heads to regulate traffic satisfactorily. New York has been doing this since October 30, 1903. However, an empowering ordinance such as here given would be more satisfactory, especially if standardized.

[2] Certain changes in terminology will be necessary, in some municipalities, to adapt this ordinance to meet local conditions; such as the substitution of "town" or "village" or "borough" for "city," and of "village president" or "burgess" for "mayor." In commission-manager cities it may be deemed advisable to give to the city manager, rather than to the mayor, the chief responsibility for traffic control. In all municipalities care must be taken that local traffic ordinances do not conflict with state motor vehicle acts.

[3] These general regulations, as revised to March 15, 1924, are printed in full in the 1924 *Municipal Index*, published by THE AMERICAN CITY MAGAZINE, pages 272 to 275.

pamphlet, entitled, "Traffic Information for the Convenience of Drivers," setting forth the penalties provided for infraction of the general and special regulations, the state and local laws governing speed, lights, sound signals, and other equipment, special regulation as regards ranking and parking, and any other information which may be useful in facilitating vehicular or pedestrian traffic.

SEC. 8.—That the Mayor shall cause to be used at any time or place, with or without notice, whether temporarily or permanently, such traffic guides as have proven to be or promise to be useful.

(a) Limit lines, in or on the pavement, may be used to define the boundaries of crosswalks, ranking and parking areas, safety, danger and neutral zones.

(b) Primary signs for warning and directing moving vehicles, including signs designating distance, shall have vivid yellow letters, arrows or graphics on a black background.

(c) Secondary signs for stationary vehicles, designating public parking or ranking spaces, shall have black letters, arrows or graphics on a bright yellow background.

(d) Tertiary signs for the control of pedestrians, designating crosswalks, etc., shall have vivid blue letters, arrows or graphics on a white background. (All traffic signs shall so far as practical denote their meaning by their shape as well as by their color, and no wording shall be placed on the face of any traffic sign except that required to denote its meaning, and this wording shall be the briefest and simplest necessary to express its meaning clearly.) The Mayor shall take steps to prevent the use of the combination of colors adopted for traffic signs for any other purpose near the curb in city streets or on any part of a country highway in the city of .....

(e) New portable traffic standards should have their bases made preferably in the form of an elongated circle, to prevent rolling if knocked down. The bases and tops of standards shall be painted bright red, the pipes or parts between the base and top with two black and three white bands, the top and bottom bands being white. Where standards are not placed within limit lines, they shall be placed on a painted white disk showing at least 6 inches outside the base.

(f) Traffic "mushrooms" or similar devices shall, when used, be always kept painted white and be placed on a disk painted white showing at least 1 foot outside of the mushroom.

(g) "Dummy cops" or similar devices may be used where practical, to assist traffic, and when used they shall be painted in a similar way to traffic standards and be placed upon disks painted white showing at least 1 foot outside of the base.

(h) Where new semaphores are provided, they shall be of such construction that the signs on them may be placed in a neutral position, so that when a traffic officer is not present the semaphores may be left to serve as dummy cops. Semaphores shall be painted in a similar manner to dummy cops and traffic standards, and where they are not provided with a platform they shall stand on white-painted disks.

(i) Traffic towers, or "crow's-nests" similar to those in use in Detroit, may be employed when, in the opinion of the Mayor, the expense warrants their use.

(j) Traffic regulation lights may be used when and where deemed desirable by the Mayor. The significance of such lights shall be: red, to stop; yellow, to exercise caution; green, to proceed.

(k) An electrically or mechanically operated signal used for the protection of highway traffic at railroad crossings shall present toward the highway when indicating the approach of a train the appearance of a horizontally swinging red light and/or disc.

SEC. 9.—That the Mayor shall cause to be issued to the members of the police force the following general order:

"You are hereby informed that it is the duty of every uniformed member of the police force to correct and instruct drivers and pedestrians in the traffic regulations and reprimand them for infractions thereof; and if an offense is committed with obvious intent to obstruct traffic or to interfere with the rights or safety of others, to take the driver's name, number and address, the vehicle number, if it has one, or in the case of a pedestrian, his name and address, and such other particulars as may be available for identification of persons or vehicles, and report same to the traffic bureau or to police headquarters for action. In case of a serious or intentional offense the offender should forthwith be arrested."

SEC. 10.—That the Mayor may cause to be substituted such devices as dummy cops or traffic mushrooms for traffic policemen at such intersections, junctions, or foci of highways as can be practically as well regulated by the use of such devices.

SEC. 11.—That the Mayor shall see to it that traffic men shall use a uniform code of signals at crossings, so as to avoid confusing drivers and pedestrians.

SEC. 12.—That the Mayor may, in his discretion, from time to time send one or more men to other cities to study traffic work in order to keep abreast of all improvemens.

SEC. 13.—That the Mayor may provide the Traffic Director when on duty, with a motor-car or a motor-cycle in practical working order.

SEC. 14.—That the Mayor may carefully consider with a view to making recommendations to the City Council or the proper department of the city government, such matters as needed street openings, widenings, or changes in curbs or car tracks, or the removal of anything within or outside the boundaries of a roadway which prevents the best use of the highway or which seriously obstructs a view of traffic; and as an aid in making such recommendations may obtain advice from engineers or others who have made a study of traffic regulation.

SEC. 15.—That the Mayor shall forthwith and hereafter from time to time cause to be prepared from the best information available an itemized estimate of expenses necessary to furnish the city of ..... with effective and up-to-date traffic regulation.

SEC. 16.—That in case any article or section of the general regulations or any special police regulation in regard to traffic is violated, the persons so violating or disobeying said general regulation or special regulation shall pay such fine or suffer such punishment as may be prescribed at the time of such violation by the laws of the state of ..... or ordinances of the city of .....

ERIE CANAL IN SCHENECTADY BEFORE IMPROVEMENT

Old Erie Canal Now an Efficiently Lighted Boulevard

Schenectady, New York, Which Converted the Erie Canal into a Boulevard Is Placing Ornamental Lighting Standards on Every Paved Street

A FEW years ago, when the newly completed New York State Barge Canal caused the abandonment of the old Erie Canal, Schenectady, N. Y., was faced with the same problem that was before many of the cities and towns of eastern New York, namely, how could the old canal bed be utilized to the best advantage? The city appreciated the opportunity offered and plans were made for the construction of a boulevard across the city, a direct route from the center of the business section to each of its largest manufacturing centers. One section of the boulevard has been completed and is 113 feet wide between curbs, with 20-foot sidewalks, parkways and underground wiring. This year, on the evening of the third of July, a switch was thrown in the local power station and this new Erie Boulevard was illuminated to fifty times the brilliancy to which it had been accustomed.

It is interesting to note that the request for this intensive illumination came from the property owners themselves. The Adirondack Power & Light Corporation, by which the installation was made, and the illuminating engineers of the General Electric Company had suggested a less impressive system. The property owners, however, realized the great advantage of added light, and enthusiastically endorsed the intensive white way installation. The same type of lamps has been installed along State Street, the chief business section. The lighting program which has been planned by the city specifies that there will be no more hanging lamps, and that in time the whole system will include "Schenectady" type ornamental standards. Schenectady has also decreed that every paved street in the city shall have ornamental lighting standards.

The details of the installation on Erie Boulevard are interesting as they show in all that 2,087 feet of street are lighted by 86 lamps mounted on 43 standards. This makes 24.25 feet of street per lamp. The total lumens per

ERIE BOULEVARD, SCHENECTADY, BUILT ON THE ERIE CANAL, SHOWING ILLUMINATION AT NIGHT

lamp amount to 16,875, or 700 lumens per foot of street. The lights, which are mounted with the center 20 feet above the street, are carried on King "Schenectady" type standards and consist of Form 21 G. E. ornamental luminous arcs. The glassware, which has an efficiency of 85 per cent, is G. E. No. 126, medium density rippled alabaster globe, which has been approved by the Art Commission of Washington, D. C., for lighting in the Federal Capital. The arcs operate on 6.6 amperes, 80 to 85 volts and consume 532 watts each.

A Brief History of Street Lighting

Street lighting is comparatively modern. Paris, France, was the first city in the world to install street lighting, the inhabitants being ordered in 1558 to place lighted candles in front of their houses. In 1788 pitch or resin bowls were substituted for candle lanterns. In 1809 illuminating gas was first used for street lighting in London, England. In 1821 Baltimore, Md., used illuminating gas for street lighting, and in 1881 electric arc lamps first made their appearance in New York City. Gas mantle lamps were first used in this country for street lighting in 1896. The modern history of street lighting began with the invention of illuminating gas and has continued with the development of the arc lamp and the incandescent light.

ORNAMENTAL LUMINOUS ARC LAMPS USED ON ERIE BOULEVARD, SCHENECTADY

Need for Eye Conservation of School Children

A SURVEY of statutory provisions in the United States and Territories for testing the sight of school children has been made by the Eye Sight Conservation Council of America, Times Building, New York City. The results of the study are available in report form in Eye Sight Conservation Bulletin No. 4.

The report estimates that at this time the number of school children enrolled in the elementary and secondary schools of the United States exceeds 24,000,000, or over 20 per cent of the population. More than 60 per cent of this number are said to have eye defects of sufficient degree to warrant correction. Even simple visual tests reveal 25 per cent with manifest defects and symptoms of eye-strain. Many are contending with vision so defective that mental development is seriously retarded, and comfort, health and even safety are jeopardized. Fully 6,000,000 of our school children are at a disadvantage.

Conclusions set forth in the report, applying to the country as a whole, point out that there is a wide diversity in the provisions and regulations. It was found that statutory provisions for the examination of the eyes of school children have not been adopted generally by state legislatures, and that only twenty states have statutes providing for eye tests. There are only two other states that have broad regulations which take the place of statutes. In most instances general physical examination laws are not interpreted to include eye tests.

The report is published "as an argument that every state and territorial possession should recognize the importance of the care of the eyes of its future citizens, that tests for defective vision may be carried out advantageously by teachers in the schools with a negligible expenditure of time, money and effort; and that state boards of education should consider it their duty to approve and provide regulations, instructions and the necessary appliances, and to so supervise the work that all school children shall receive the attention that is their right."

In nearly all states little is being done outside the larger cities. There is pressing need for eye conservation in the smaller towns and in the rural districts as a part of the general plan to improve country life. Cooperation of state boards of health is advocated.

Results of Three Years of a Smoke Abatement Campaign

By H. W. Clark

Chief Deputy Smoke Inspector, Salt Lake City, Utah

DURING the winter of 1919-20, a detailed study of the smoke problem then existing in Salt Lake City, was made by this city in cooperation with the U. S. Bureau of Mines and the University of Utah. The conditions found and remedies suggested were set out in a full report in May, 1920, by Osborn Monnett, the engineer who directed the investigation.*

Late in 1920, an ordinance was passed following closely the suggested ordinance in the Monnett Report, and a new Department of Smoke Inspection and Abatement was organized. Active work began about January 1, 1921. The suggestions made in the Monnett Report have been followed out as closely as the funds provided would permit. The results of the campaign for four winters of supervision and three summer campaigns of reconstruction work have just become available in a report covering this period †

The accompanying chart shows graphically the progress that has been made. Definite figures in the report show that smoke abatement results in a sufficient fuel saving each year to pay twice the cost of maintaining the Smoke Department.

The results of the campaign in Salt Lake City, to date, might be briefly summarized as follows:

The production of smoke from plants in the industrial and business districts has been reduced 93 per cent since the winter of 1919-20.

The number of hours during which light or dense smoke conditions existed in the atmosphere, as recorded by the U. S. Weather Bureau, has been reduced 32 per cent and 39 per cent, respectively.

The atmosphere of the business district, formerly the center of the smoke cloud, *is now the clearest part of the city.*

The smoke from railway locomotives has been reduced very materially, although definite figures as to the reduction are not available.

The city's future problem is to tighten up on enforcement, by police court prosecution against any plants that violate the ordinance; keep after railroad officials to get equipment improved and firemen disciplined for violations; and *last, but most important, to begin a real campaign of smoke reduction in residences.*

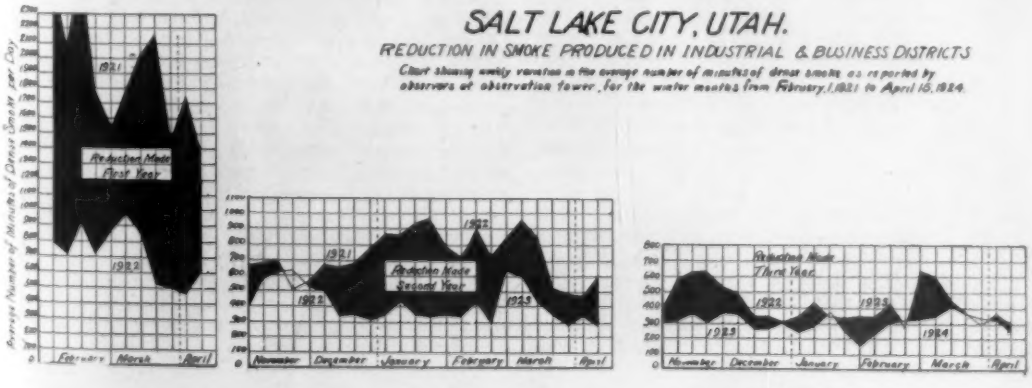
Procedure for Success in Smoke Abatement

The experience gained in Salt Lake City indicates that to accomplish results quickly and economically, procedure in smoke abatement work must be somewhat as outlined below.

In the first place, every plant in the city must be investigated in detail by an experienced engineer, and every measurement and every bit of data that will have a bearing on the plant must be obtained. The load of the plant must be accurately determined and this will determine to some extent the type of furnace changes to be made.

* See the July, 1920, issue of THE AMERICAN CITY for a brief review of this investigation by Mr. Monnett.

† Report of Smoke Abatement in Salt Lake City for Three and One-Half Years, by H. W. Clark. Copies of this report may be had upon application to Salt Lake City.



The data obtained must be studied carefully, so that the most economical and successful solution possible can be worked out. This solution must be worked out in detail and in such a manner that it is absolutely certain that the desired results will be accomplished.

The next step is to get the owner to have the necessary changes made. As most ordinances do not make it mandatory upon the plant owner to make these changes at the request of the Smoke Department, it usually becomes necessary to persuade the plant owner to make the changes desired. Increased economy for the plant owner is certainly a great help in persuading the owner to make the changes, especially when the smoke abatement engineer can definitely assure the plant owner that such a saving will be made.

After the plants have been changed to put them into condition to operate without smoke, it is necessary to continue to patrol and supervise these plants to keep the operating crews on their toes in order to keep the plant clear. The amount of supervision required depends entirely upon the kind of men operating the plants. With many plants it will not be necessary to call on them, except on very rare occasions, and others will require visits almost daily to keep the plant from smoking.

The plants must be inspected periodically to keep them maintained in proper operating condition. Brick work is in need of repairs at frequent intervals, smoke pipes become leaky, and chimneys and combustion chambers get full of ash. In many cases, the owner will not have these furnaces cleaned or repaired unless the necessity is brought to his attention.

The smoke abatement department must be a permanent part of any city government where the smoke nuisance is troublesome. The campaign must be continuous if a city's atmosphere is to be kept clear. Ample work must be done each year to keep smoke down to the required minimum. If things are let go just one season, the conditions will immediately grow worse and much of the progress made in the preceding years will be lost in a very short time.

In order to continue to improve conditions in Salt Lake City at a satisfactory rate, it will be necessary to maintain substantially the same size smoke department to control the situation as at present, and, in addition, increase the force during five or six winter months to sufficient size to instruct and supervise the operators of all *residence heating plants.* If part-time men are used for this work, the cost of patrolling the residence district will not exceed fifteen cents per house per season.

Public Improvements and Increased Values

An Editorial from *The Christian Science Monitor*

WHEN nearly forty years ago Henry George, a San Francisco printer, who had written a book dealing with the persistence of poverty despite the wonderful progress made by inventive genius in increasing the production of wealth, became a candidate for Mayor of New York City, his proposal that all increases in land values due to the growth of population or public improvements should be taken by taxation for city revenue was regarded as rank socialism and an attack on property rights. So dangerous was his candidacy regarded that many prominent Republicans supported the Democratic candidate for Mayor, through fear that their own candidate, Theodore Roosevelt, could not possibly be elected. The suggestion that the progressive increase in land values should be taken for the benefit of the community, to whose growth and activities such increase was due, was denounced by some of the clergy and condemned by great business interests.

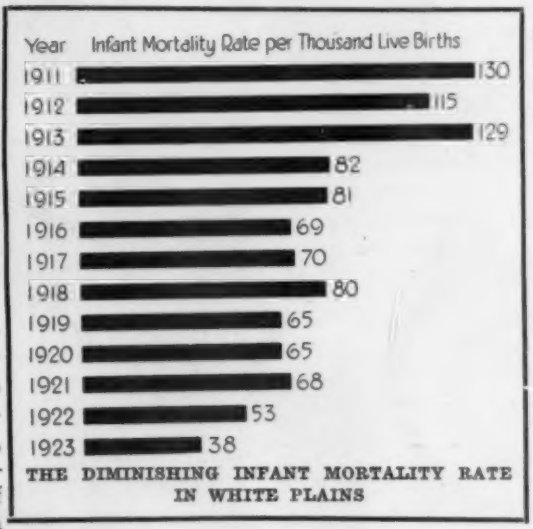
It will no doubt surprise many of those who then opposed the taxing of land values to find that the city of New York is now contemplating the construction of a subway under Sixth Avenue, the cost of which is to be provided by taxes on abutting property that will be benefited by the new transportation line. They will be further surprised to learn that, instead of regarding this innovation as confiscatory, the property owners along the proposed route are willing that they shall be taxed in proportion to the increased value of their land that is expected to accrue. Further than this, the corporation counsel of New York has rendered an opinion that the statute providing for assessing the cost of subways on the property benefited is entirely constitutional.

The difficulties in securing the enormous amounts of capital for the construction of new transportation systems, experienced by many great cities, will practically disappear if the system proposed in New York shall be generally adopted. On its face it would seem to be a perfectly fair proposition that a public improvement which will greatly increase the value of abutting property should be paid for by assessments on the increased values. The owners of the abutting land certainly cannot complain if they are called upon to pay part of their increased revenues for the construction of improvements which will directly benefit them. That land values which have been created by other activities of the community should be taken in taxation for public purposes may not yet seem so obvious, but the changed attitude of property owners in New York is at least significant as showing that the basic idea involved is finding general acceptance.

Reduction of the Infant Mortality Rate in Small Cities

By Edwin G. Ramsdell
Health Officer, White Plains, N. Y.

THE gradual reduction of the infant mortality rate in White Plains is instructive, because a definite effort has been made over a period of years to reduce this mortality, and it would appear that this effort has been effective. White Plains is a city of approximately 25,000 inhabitants, located within 23 miles of New York City. It is not a manufacturing city, the population being largely comprised of the so-called commuters' families. There is, however, a group of approximately 5,000 Italian people and a group of about 1,500 colored people. Most of the Italian and colored people reside in definite districts of the city.



THE DIMINISHING INFANT MORTALITY RATE IN WHITE PLAINS

It is difficult to analyze the relative importance of the factors concerned in the reduction of infant mortality, because the entire public health program of the community has a bearing on infant as well as general mortality. White Plains has been working along the following general lines to reduce its infant mortality:

1. To get all births reported.
2. To increase the efficiency of prenatal care.
3. To insure satisfactory hospitalization or home care for the lying-in period.
4. To follow up systematically all infants during the first year, and guide mothers when necessary in the problems of infant feeding and hygiene.
5. To emphasize the importance of keeping the well baby well through all possible publicity channels, the most effective being the Little Mothers' Leagues and the Junior Health Leagues.
6. To regulate strictly the community milk supply, advocating for infant feeding, pasteurized milk only.
7. To provide auxiliary health services at a general Health Center, including venereal disease clinics, tuberculosis clinics and dental clinics, as well as the regular infant welfare clinics which frequently become well-baby conferences.
8. To select carefully the nursing and medical personnel to carry out this type of program.
9. To obtain the confidence and cooperation of the practicing physicians of the community.
10. To coordinate the efforts of all organizations interested in the field of public health and infant welfare.

These are the ten principal factors which appear to have been most important in reducing the infant mortality in White Plains.

Prenatal and Infant Welfare Clinics

The work of the Prenatal Clinic is made effective by the enthusiasm of the nurse, who is obliged to visit frequently the homes of expectant mothers and urge them to come to the clinic for examination. Not infrequently does she have to bring these patients to the clinic in the ever-useful Ford. At this clinic, which is in charge of the obstetrician of the local hospital, a routine physical examination is made, including pelvic measurements, urinalysis, Wassermann test, and blood pressure observations. The doctor and the nurse cooperate with the practicing midwives and have secured their confidence. Early abnormalities are recognized and proper treatment instituted before it is too late. This early acquaintance with these mothers makes it possible for the department to institute a very early post partum follow-up.

A weekly infant welfare clinic is held at which babies are regularly weighed, formulas prescribed if necessary, and as much advice given to keep the well baby well as possible. The most important feature, however, of this clinic is the work of the nurse in following

these mothers back to their homes to actually watch the preparation of the formula; to correct improper home conditions; to arrange the environment for the well baby which will tend to insure his keeping well. At the present time, White Plains has 486 babies enrolled at our Infant Welfare Station.

Little Mothers' Leagues

For ten years White Plains has been particularly fortunate in having a volunteer worker who has been able to continue the work of the Little Mothers' Leagues throughout the school system. She has graduated these little girls each year from her leagues, with some fundamental knowledge of the general principles of child hygiene. The lessons taught to these little mothers are carried into the homes, and are, without doubt, the most useful and the most effective method of infant hygiene publicity. At the present time, there are in White Plains five Little Mothers' Leagues with an enrollment of 231 little girls. We have also organized similar leagues for boys, which are called the Junior Health Leagues. Instruction given to these little boys is along a different line, but certainly contributes to the hygiene of the home. We have five Junior Health Leagues with an enrollment of 105 boys.

Milk Supply

The control of the milk supply has not been easy. We have an efficient laboratory service, which reports monthly on the bacterial count of all milk sold in White Plains. The minimum standards required by the State Department of Health are enforced, but it has been necessary almost constantly to threaten, first one milk dealer and then another, to keep even the pasteurized milk safe. This work is unpleasant, but is important. The public should stand back of the Health Department in preventing the sale of dirty milk.

Health Center Clinics

The Health Center clinics are useful. Expectant mothers who show a positive Wasserman may be carried through the course of salvarsan, and our records show several mothers who have never been able to give birth to living children before this treatment, who now have apparently healthy babies. The tuberculosis clinic affords an opportunity for careful chest examination with X-ray observations if necessary. Likewise, the dental clinic may prevent oral sepsis.

Nurses and Doctors

The type of nursing and medical personnel must be carefully selected. The nurses must be women of individuality and initiative, because the most important part of their work is carried on in the homes, where they are on their own responsibility. The nurse in White Plains, who has been specializing in the infant welfare work, has been with us for the past ten years. She knows infant feeding, is tactful with the mothers, is competent to instruct them in their homes with the preparation of formulas, and is enthusiastic and conscientious. The doctors at the various Health Center clinics have been selected not only on account of their ability, but because they represent affiliations with other institutions. For example, our obstetrician has charge of the obstetrical service at the local hospital; our tuberculosis clinician is in contact with the tuberculosis pavilion at the local county hospital.

The cooperation of the practicing physicians in the community has been obtained as a result of a deliberate effort to help them with their work, and to treat their communications with tact and consideration. We have obtained almost hundred per cent cooperation from the doctors in White Plains.

To coordinate the activities of private agencies interested in infant welfare, a monthly meeting was organized four years ago to which representatives from all such agencies were invited to meet the Health Officer. As a result, a permanent Public Health and Welfare Workers Monthly Conference was organized. This organization has been most helpful in bringing about a better feeling between various groups interested in the improvement of health conditions.

Continued Gain in Whole-Time County Health Officers

ACCORDING to data obtained by the Rural Sanitation Office of the U. S. Public Health Service, there was a net gain of 20 counties in the United States having whole-time health officers on January 1, 1924, as compared with the previous year. The total number of counties or districts providing such service for their rural sections increased from 109 in 1920, to 161 in 1921, 202 in 1922, 230 in 1923, and 250 in 1924. Most of the increases during the last year were in states in which the respective state health departments, with the cooperation of the U. S. Public Health Service or the International Health Board, or both, were enabled to give encouragement, technical advice, and financial assistance to county or district health departments.

Oil Fields Increase Municipal Construction in Monroe, La.

By H. H. Russell
City Attorney

MONROE, La., for the last few years has enjoyed a sustained development, industrially and commercially as well as in population. It is the parish seat of Ouachita Parish and is situated on the Ouachita River in northern Louisiana, approximately 40 miles from the Arkansas-Louisiana Line, 75 miles west of the Mississippi River, and 100 miles east of the Texas boundary. It has always been the center of a very fertile agricultural region, but, despite that fact, and although it is the third oldest town in Louisiana, it was in 1920 a town of but 12,675 people.

The Monroe gas field was discovered in 1917, and by 1920 large developments had been made. This development has been such that Monroe's population is now estimated at 20,000, and the industrial centers in the gas fields surrounding it give it an additional suburban population of probably 10,000. The growth of the city from a home-building and business standpoint has been fully as rapid as its industrial expansion, and the work of public improvement has kept pace.

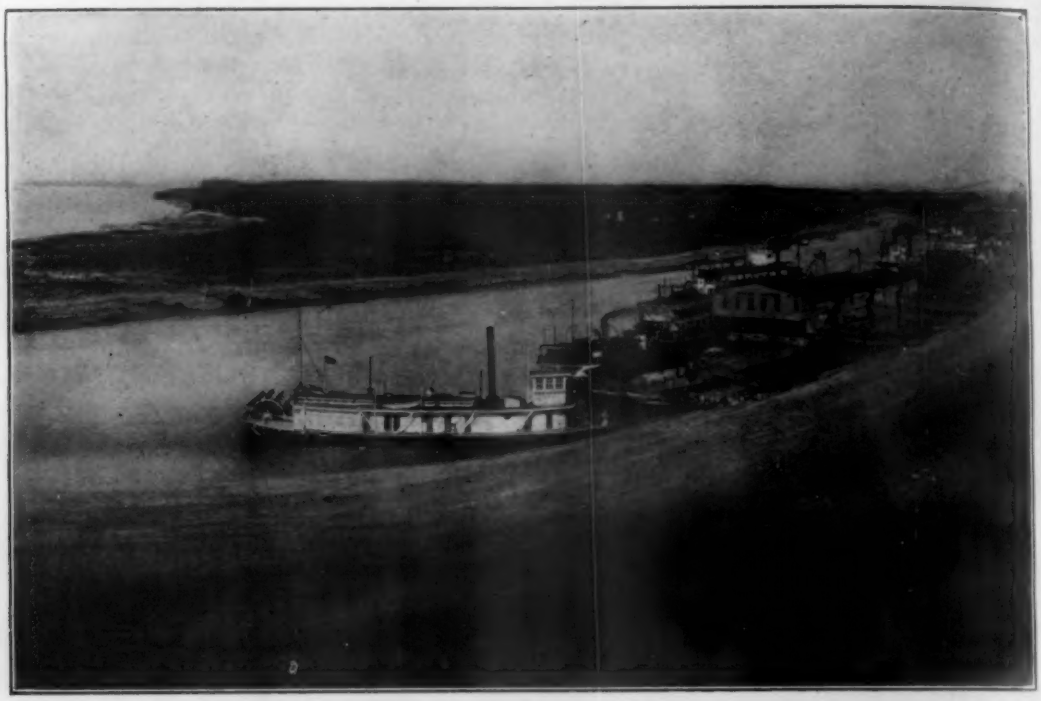
In 1920, there were in Monroe 0.6 miles of brick streets, 20 years old, and while the city owned its own electric light, water-works and power-plant, as well as its street railway lines, these utilities were old and run-down. In the last three years—in so far as street paving is concerned, I should say, in the past 29 months—there have been laid something in excess of 25 miles of modern asphalt streets, and work is going forward on contracts covering several additional miles, with the certainty that the present program, even if it does not have to be expanded to cover added growth, will by the end of 1925 see 40 miles of new pavement completed.

During the period 1920-1924, the municipality has built a new power and water-works plant at a cost of $650,000, and a new sanitary and storm drainage system at a cost of $500,000.

All the paving contracts to date have been awarded to, and the work done by, the E. J. Deas Company, which had been engaged in paving work in Shreveport and other Louisiana cities for some time prior to the inception of the Monroe program. All topping work has been done with Texaco asphalt. About 75 per cent of the completed mileage consists of sheet asphalt on a 6-inch concrete base, the sheet asphalt being composed of a 1½-inch binder course and a 1½-inch top or wearing surface. The remaining 25 per cent of the total mileage is asphaltic concrete, one course of 2 inches laid on a 5-inch concrete base. All streets have uniform combination concrete curb and gutter, and a complete system of subsurface drainage. Water is not permitted to flow more than one block in the gutters.

A TEXACO ASPHALT PAVEMENT ON LOUISVILLE AVENUE, MONROE, LA.

A River Front as It Is and Might Be



THE ISLAND IN FRONT OF MEMPHIS, TENN., AS IT APPEARS TO-DAY

This island has been created in recent years by the Mississippi River. It offers to Memphis a splendid opportunity to acquire, and to develop gradually, a park of large acreage virtually at the city's front door

DEVELOPMENT OF THE ISLAND AND RIVER FRONT AS PROPOSED IN THE COMPREHENSIVE CITY PLAN OF MEMPHIS

This plan, in the recently published report of Harland Bartholomew, City Plan Engineer, carries the following caption: "Memphis has exceptional opportunity for development of the river front. The treatment suggested is not beyond realization. It has genuine utilitarian significance. It will largely solve the automobile parking problem. Twenty-five years hence such a water-front would be an outstanding civic asset"

Traffic Lines and Safety Zones Reduce Accidents in Memphis

By Mary Yerger Raymond
Safety Council Division of Memphis Chamber of Commerce

ALMOST important step in the interest of community safety in Memphis was taken when the Memphis Safety Council was organized and became a division of the Memphis Chamber of Commerce. E. W. Ford, Vice-President of the Memphis Street Railway Company, was named President of the Council; and C. M. Anderson, then manager of the Safety Division of the Milwaukee Association of Commerce, was chosen for the position of Manager.

During the formation period Carl L. Smith, field secretary of the National Safety Council, spent some time in Memphis assisting in the initial work and organizing the Bureau in line with the national plan. The Council became a division of the National Safety Council and has consistently adhered to the policies of the parent organization.

During the eleven months which have passed since its organization, the Council has justified its existence and performed a notable service to Memphis. Continuous safety propaganda has been circulated in the attempt to prepare the public mind for safety measures. A school for truck drivers was conducted during the winter, which was attended by over six hundred drivers of commercial vehicles.

Organized school safety work was carried on through Junior Safety Councils, a special feature of which was the patrolling of dangerous street intersections near the schools. The boys in these patrols were trained by an officer furnished by the Police Department, which has actively supported the work of the Council.

One of the latest and most effective accomplishments in the interest of safety is the system of traffic marking, which was the result of intensive study of the traffic situation by the Council's traffic division and representatives of the Memphis Police Department.

That study resulted in a comprehensive plan for the protection of the pedestrian and motorist, which was recommended to the city authorities, approved, and put into effect on May 25.

POSTER WIDELY CIRCULATED BY THE MEMPHIS SAFETY COUNCIL TO FAMILIARIZE THE PUBLIC WITH THE NEW TRAFFIC-MARKING REGULATIONS

In an article printed in the June issue of the *Memphis Chamber of Commerce Journal,* Earl R. Barnard, Inspector of the Memphis Police Department, explained the purpose of the new regulations, as follows:

"Clearance lines have been marked for motorists along street car tracks on Main Street, and safety zones at street corners for pedestrians have been designated. These clearance lines will permit automobiles to run between parking lines, in this way eliminating congestion, preventing accidents and enabling street car passengers to reach their destinations sooner.

"The pedestrian lanes, formed by the crosswalk lines, are used to guide pedestrians, who should move with the traffic and not against it. Automobiles will be required to stop behind the pedestrian line, in order to provide a clear walkway for the pedestrians.

"Parking lines have been marked, which means that automobiles must park parallel to the curb inside of these lines.

"It will be understood that in marking the boulevards with the center line, the purpose is to keep traffic to the right of this line at all times. Actual demonstrations have proved that this results in greater safety and in appreciably speeding up travel on the boulevards. Slow-moving vehicles should drive near the curb to enable automobiles traveling at a higher rate of speed to pass to the left of such vehicles and remain on the right of the center line.

"A feature of the recent improvements which will add materially to the comfort and security of those using the streets is the new type safety zone, which has been installed on Main and intersecting streets. These zones provide islands of safety for pedestrians where they can feel reasonably safe before boarding or alighting from street cars. This feature enables vehicles to pass with safety without waiting for street cars to get under way.

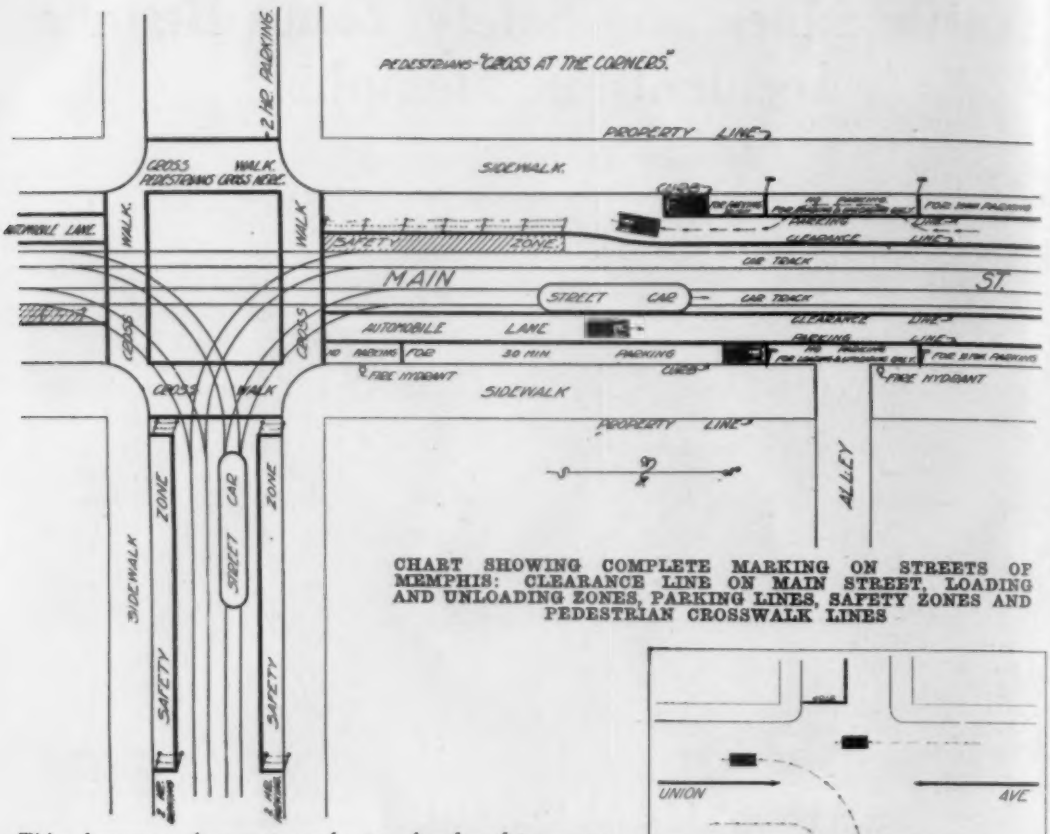


CHART SHOWING COMPLETE MARKING ON STREETS OF MEMPHIS: CLEARANCE LINE ON MAIN STREET, LOADING AND UNLOADING ZONES, PARKING LINES, SAFETY ZONES AND PEDESTRIAN CROSSWALK LINES

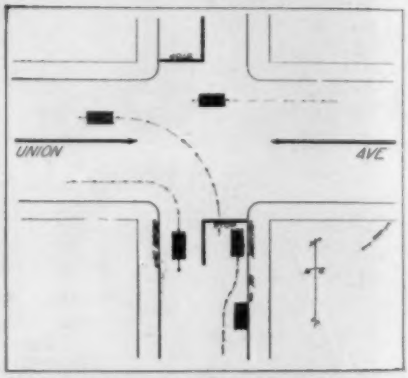


CHART SHOWING INTERSECTION WITH "STOP" MARKING ON UNION AVENUE

This, however, does not apply to closed safety zones.

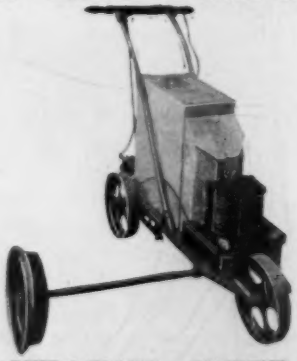
"It was after a study of the experience of various cities in the United States that the Police Department and the Safety Council's Traffic Division concluded that the type of zone now in use would prove practicable and satisfactory in Memphis.

"The safety zone, it should be understood, is for the convenience of drivers as well as pedestrians. Motorists are cautioned not to stop in the safety zone (safety lane) to unload or take on passengers. This not only results in congestion of traffic but invites accidents as well. Pedestrians should enter and leave the safety zone at the intersection. The 'entrance' and 'exit' are clearly marked at each zone."

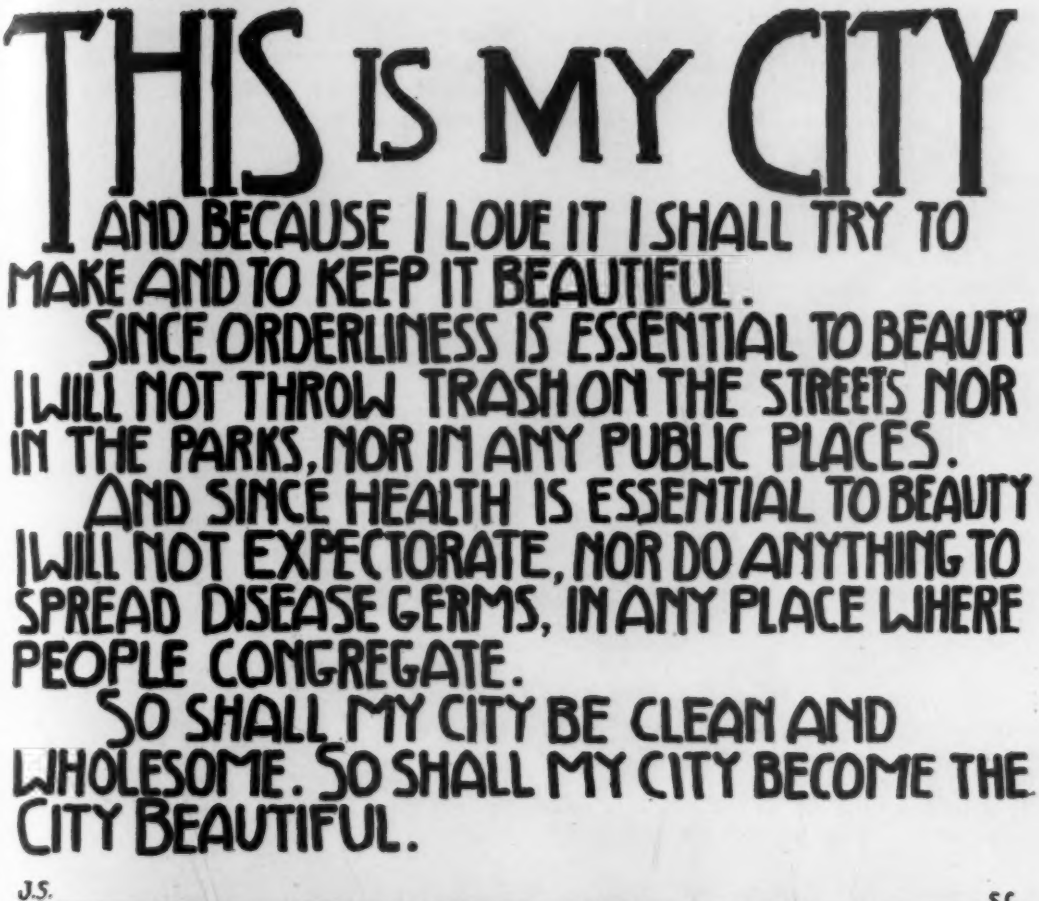
In addition to the marking features, new parking rules became effective on the same date, which clearly outlined the Police Department's ruling affecting parking, the use of loading and unloading zones and the space in front of fire hydrants or alley openings.

The efficacy of the new safety provisions was demonstrated during the recent United Confederate Veterans' Reunion, held in Memphis, June 4, 5 and 6. With over 50,000 visitors, 5,000 of whom were old and infirm veterans, not one accident occurred.

Valiant work was done by the Police Department, the Boy Scouts, R.O.T.C. cadets and others, but it is the belief of those who studied the situation that the clearly defined marking system played no small part in the remarkable achievement. It was recognized, too, that the Memphis Safety Council has not been idle, but has done much to make a reality that most powerful factor for safety—public cooperation.



LINE-O-GRAPH MACHINE USED IN STREET TRAFFIC MARKING, EQUIPPED WITH A SPECIAL ATTACHMENT WHICH ENABLES ITS USE ON THE CAR TRACK, FACILITATING THE MARKING OF THE PARALLEL CLEARANCE LINE. THIS UNIQUE ATTACHMENT WAS DEVELOPED BY J. J. VAUGHAN, MASTER MECHANIC OF THE MEMPHIS STREET RAILWAY COMPANY


THIS IS MY CITY
AND BECAUSE I LOVE IT I SHALL TRY TO MAKE AND TO KEEP IT BEAUTIFUL.
SINCE ORDERLINESS IS ESSENTIAL TO BEAUTY I WILL NOT THROW TRASH ON THE STREETS NOR IN THE PARKS, NOR IN ANY PUBLIC PLACES.
AND SINCE HEALTH IS ESSENTIAL TO BEAUTY I WILL NOT EXPECTORATE, NOR DO ANYTHING TO SPREAD DISEASE GERMS, IN ANY PLACE WHERE PEOPLE CONGREGATE.
SO SHALL MY CITY BE CLEAN AND WHOLESOME. SO SHALL MY CITY BECOME THE CITY BEAUTIFUL.
J.S.
S.C.

Art Posters: An Aid to Movements for Civic Betterment

By Minna McLeod Beck
Art Director of Schools, Harrisburg, Pa.

ONE of the best aids to effective teaching in civics is the art poster. Think of the opportunity for service here, for rendering real assistance to a worth-while cause and, at the same time, for realizing in the pupil aims of great educational value.

These aims are, broadly speaking, two: to get over to the pupil, first, propaganda of an educational nature, say with regard to personal health, civic needs and responsibilities, etc.; and, second, to teach him, by means of the problem assigned, art principles such as good spacing, tone relationship, and color harmony which will be valuable in their application to many other subjects. A subsidiary aim here, which for some pupils may subsequently become of paramount interest, is the vocational or professional aspect of poster-making.

It is this second aim, of course, which justifies the place of the poster problem in the art outline, or course of study. However, considering the nature of the first aim, would the

teacher be justified in assigning, for art study purposes, aimless and vague subjects such as "October," "Spring," "Wayside Inn," etc.? Scarcely—and especially as the pupil's reaction to a problem is much greater if he feels that he is rendering service or doing something for which there is an immediate need or recompense. This last is the psychological justification for the motivated poster problem.

We have had in Harrisburg, in connection with our public school work, a number of successful poster campaigns. One was in cooperation with the Welfare Association; another advertised Music Week; and one of the most successful was that connected with a Clean-up Week program.

The Mayor of our city usually issues a proclamation setting aside a certain week as Clean-up Week. The Art Department of the schools, anticipating this proclamation, wrote to the Mayor offering the assistance of all the sixth and seventh grades in the city. The enthusiasm of the special teachers of art, the grade teachers, and, above all, of the pupils themselves, was all that could be wished, and splendid results were obtained. There were hundreds of posters clever in ideas and good from the standpoint of design.

One of the newspapers of the city altruistically agreed to print for us one thousand each of two posters which seemed particularly appropriate. On the first day of Clean-up Week these two posters, one of them beginning, "This is my City," and the other, "I am the Guest of this City," after being framed in the Woodshop of the Technical High School, were placed conspicuously in the very center of Market Square, around which all the traffic circulates. On the same day, as previously arranged, the Boy Scouts distributed these posters over the city, and many merchants placed them in their windows.

Another feature of the week was the exhibition, in the windows of a large department store, of many original posters, chosen for good design and bright ideas. These were labeled, "Posters Made by the Children of Harrisburg in the interest of Their Community"—a slogan adopted for all our window displays of like nature.

The Chamber of Commerce was interested in the campaign and mailed to all its members in the city, and friends out of the city, copies of the printed posters. The newspapers were generous in their praise of the pupils' work and there was much favorable comment.

It must not be forgotten to mention that, in initiating this problem, the true purpose of Clean-up Week was explained—the matter of *stressing* cleaning up for *one* week in order that for *fifty-two* weeks its lessons need not be forgotten.

Watertown, N. Y., Erects Memorial Health Building

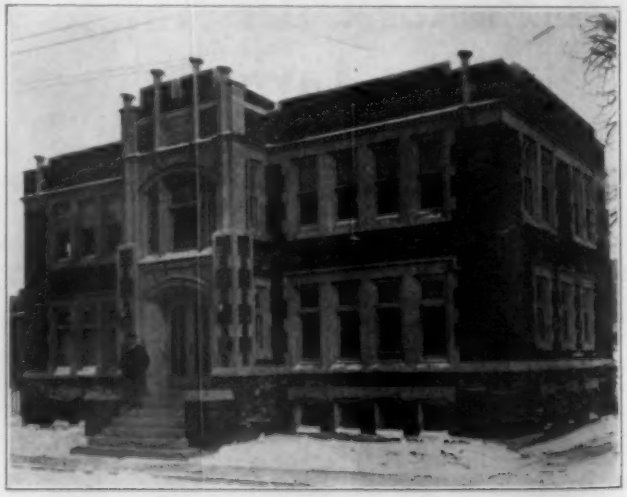
A NEW health building, designed as a memorial to the men of Watertown who served in the World War, has recently been formally opened in that city. It will contain a bronze tablet of Tiffany design bearing the names of local men who died in service. The property represents a value of approximately $50,000. The lot was a gift; about $25,000 was donated by contributors to the Watertown War Chest, who assigned to this later project the amounts which otherwise would have been returned to them at the close of the war activities; the balance was raised largely by private subscription. The architects contributed their services.

The building is centrally located, stands alone, and is assured light on all sides. Its dimensions are about 45 by 78 feet.

In addition to the office of the superintendent and offices for the local Red Cross Chapter, quarters will be provided for tuberculosis, child welfare, dental and other clinics. A parking space for baby carriages has been provided in the basement.

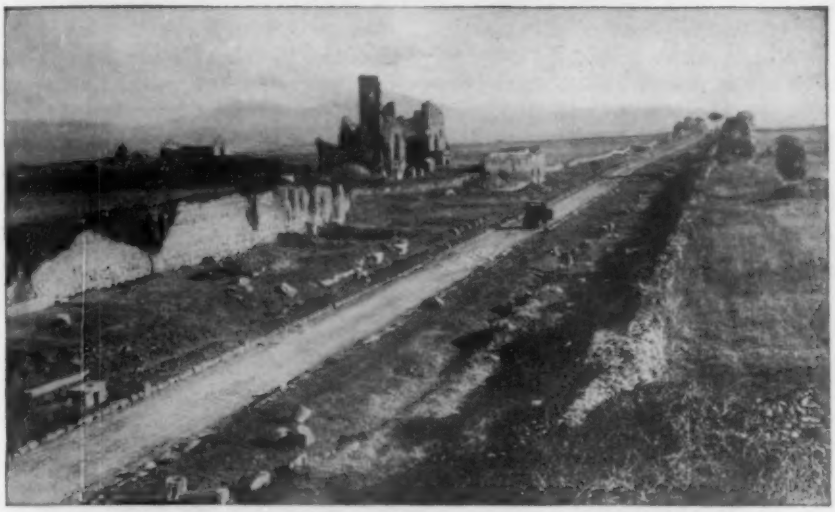
The erection of the Memorial is due largely to the efforts of the Watertown Visiting Nurse Association.

The description of this memorial appeared in *Health News*, New York State Department of Health, Albany, N. Y. The view below shows the exterior of the building and gives an idea of its substantial construction.



WATERTOWN'S MEMORIAL HEALTH BUILDING

Good Roads---312 B. C. and 1924 A. D.



ROME'S "QUEEN OF ROADS"—THE APPIAN WAY

Via Appia, the Appian Way, was constructed as a military road from Rome to Papua, a distance of about 142 miles, by the Emperor Appius Claudius about 312 B. C. and was later extended to Brundisium, a total of about 360 miles, and completed by Julius Caesar. It was known as "the Queen of Roads" and was adorned with statuary and pagan temples. It was built without regard to cost, by slave labor, and is said to have been in excellent condition 800 years after its completion. The illustration shows a portion of the road uncovered in 1850 and the ruins of ancient temples as they stand to-day. To build such a road to-day would cost about $250,000 a mile. Its inadequate width of 18 feet seems ridiculous as compared with the requirements of to-day's important transport arteries

AMERICA'S "IDEAL SECTION" OF THE LINCOLN HIGHWAY

Compare this outstanding example of modern American highway construction, the Ideal Section of the Lincoln Way south of Chicago, with the road which expressed ancient Rome's best efforts 2200 years ago. The Ideal Section is 40 feet wide—10 inches of reinforced concrete. It has been suggested that this section of the Lincoln Way be marked with tablets commemorating the men who have had most to do with modern America's highway progress. The transcontinental road is being beautified and adorned with monuments and tablets marking historic points in many states. The Ideal Section paving, said to be indestructible by traffic, cost $62,000 a mile. These illustrations are published through the courtesy of the Lincoln Highway Association

Winter Construction of Public Works

PUBLIC works form more than 25 per cent of all construction, varying in the last few years from three-fourths of a billion to over a billion dollars. Their proper control is, therefore, of the greatest importance in any program to distribute general construction activity more evenly throughout the year. Good public policy requires that contracts for public works should be let when the work can be performed economically and with the least possible interference with private construction. How seldom such a policy is followed is shown by the replies of 200 engineers in all parts of the country to the question "Are public improvements rushed right along in the peaks of the annual building season?" To this 192 answered "Yes," and many added that public works were initiated without regard to private demands upon the construction industries.

The report of the President's Conference on Unemployment, on "Business Cycles and Unemployment," brings out clearly how well adapted public works are for long-range planning, for expansion in years of depression, and for slowing up in years of general business activity. It is equally possible and desirable that public works be planned with special regard to seasonal conditions, and that all work which is not urgently required be either held up until the peak season is past or started early enough to take advantage of the general midwinter slump. With the intelligent use of new methods of construction and of protection for both men and buildings during the winter season, much of this work is well suited for economical prosecution during the winter. That work which is not suitable to carry on actively during winter weather can still be planned so as to proceed at maximum capacity during the intermediate months rather than during peak periods in private work.

One obstacle that has been found to prevent such conscious scheduling with reference to seasonal conditions is the limitation imposed either by statute or customary procedure in preparation for public works construction. Thus, where work is dependent upon appropriation by a legislature, and that appropriation does not become available until late in March or April, the work, if carried forward promptly, is likely to come within the peak of private activity. In many other instances the number of necessary legal steps which must be taken before the contract can finally be awarded and the length of time either required by law or made necessary by the procedure itself, so delay the work that it is considered necessary to rush it on to completion as rapidly as possible after the awarding of the contract. In cases of this sort, if the procedure could be simplified or if each step were not dependent upon a preceding step, a good part of this lag could be eliminated and time enough remain so that construction could be scheduled from a seasonal standpoint and, though sometimes stretched out over a longer period, still permit completion at a date as early as under present practice. A very definite step to improve such situations is the provision, either general or specific, that funds be made available to administrative officials for the preparation of plans and specifications well in advance of the time actual construction is to begin, in order to reduce the delay after the appropriation is made.

Seasonal Operation in the Construction Industries: The Facts and Remedies

Under the foregoing title there has been published by the McGraw-Hill Book Company, of New York, a Report and Recommendations of a Committee of the President's Conference on Unemployment, with a foreword by Herbert Hoover. The accompanying article comprises part of the chapter on Public Works.

How Officials and Contractors Can Help

The public administrative officials in charge of construction work can play an important part in making such changes as are indicated by the needs for economy and employment. Foresight in planning the work, the collection and use of information showing exactly what the seasonal trend is in construction of that particular kind, and the efforts made to change customary or legal requirements which operate to accentuate the seasonal tendency in their construction work are having a considerable and increasing influence in the right direction. If the administrative officials in charge of public works construction were possessed of discretionary powers governing

both the letting of the contract and the time limit within which work must be completed, they could effectively be made responsible for the practice of economies and the pursuit of a policy of relieving unemployment through the best timing of the work.

Contractors on public works, as well as those on private jobs, can greatly assist by making a thorough study of the most successful methods employed in winter construction as well as of the problems of management and organization involved. Where there are opportunities to take advantage of lower prices of materials, and where greater efficiency is secured from labor during times when employment is less plentiful, the contractor has it in his power to encourage public works in off-seasons by passing on these benefits in the form of lower bids. Since his overhead cost per job or unit of work is considerably lessened when his organization is kept together throughout the year and his machinery and equipment are idle for a shorter period, he can, by taking on winter work, cut his customary margin of profit and still make more money as a result of the full year's work. Contractors, by their general attitude, their willingness to take work during the winter and perform it satisfactorily, and probable lower bids and other inducements, can exert a considerable influence upon the officials with whom contract letting rests, to the end that work shall be timed when it can be carried out most economically.

Making Funds Available

Legislative bodies have an important part to play in bringing about a change in the present methods of handling public construction jobs. Where continuing appropriations for a particular kind of work are required in order that such work may be intelligently scheduled to come as largely as practicable in slack seasons, they should be provided. In some cases the granting of greater discretionary powers to the administrative officials in charge of work is needed, and where the legal requirements surrounding the methods of contract letting are unnecessarily complicated or obsolete, active steps should be taken to change them.

In cases of cities where construction funds are not available until the beginning of a fiscal year, at a time which makes contract letting necessarily coincide with the peak in private letting, provision could be made for contracts to be let and work to start before the beginning of the fiscal year when the money is to become available. Where changes are advocated by administrative officials in order to allow them to schedule their work more effectively, attention should be given to the seasonal conditions in question and every possible allowance made so that the construction year may be lengthened.

Crystallizing Public Opinion

The attitude of the general public is of the utmost importance in this problem of the seasonal aspects of public works construction. It is the general public which pays the bills for expensive construction during peak periods, and which suffers because of unemployment in slack times. An active interest in the whole subject, and realization of the large losses and waste involved in a seven to ten months' building year, should result in bringing sufficient weight of opinion to bear so that all concerned will be forced to accept the new viewpoint. The leadership of civic bodies within the community and of newspapers and other public agencies will help in molding and crystallizing public sentiment and will result not only in lower costs of construction and more efficient work, but in lessened unemployment during slack seasons, and in the elimination of such wasteful competition for labor and materials between public and private work as was witnessed in the summer of 1923.

While public buildings for the use of state and local governments are subject to the same climatic limitations as private buildings and, in addition, to limitations governing the authorization and expenditure of money, this field contains probably the best possibilities for off-season construction. Although the amount of building of this kind is small when compared to the total of all kinds of construction, yet the erection of a large public building in a small community is likely to have an important influence for stabilizing construction. The results of public buildings so planned should be more economical construction for both the public and the private builder, lessened overhead costs, actual savings to the taxpayers, and diminished unemployment in the community during the winter period. Here is a case where the real remedy lies in influencing the point of view of the public and of the legislative bodies and officials directly in charge of this construction work. Contractors who do work of this kind, civic organizations, and individuals can all help to develop this point of view. The effect of such work carried on at a maximum speed during the winter, and slackening up when private demands are greatest, would be very important,

since men are employed who would otherwise be idle at one period of the year and are released for other purposes during the busiest season.

Sewers and Water-Works

Another important type of public works in cities is the construction of sewer and water-works systems. This work is entirely out of doors and subject to the fullest extent to weather conditions. The argument of the severity of the climate in northern cities is generally advanced as making impossible the successful prosecution of such work during the winter, but a number of cities with the most rigorous climates have a contrary experience.

The favorable experience of these latter cities seems to indicate that there are different points of view and different experiences in conducting the same work under apparently similar conditions. This appears to show that the habits of the contractors and the attitude of those in charge of the work need to be changed in order to carry on winter work of this kind successfully. That it can be done successfully is shown by the cases mentioned above. Until methods are changed as a result of experience, it is not unlikely that experiments might prove not wholly successful. With more experience to draw upon, with labor adapting itself to new conditions, with the more extensive use of modern machinery for excavating, back-filling, and work of that kind, and with increased understanding of the public policy served, it is probable that most of our northern cities can successfully carry on this work throughout the year.

Winter Contracts, Winter Delivery, and Spring Execution

Even in the cases where it is not desired actually to carry on outdoor work during a period of two or three months, a great deal can be accomplished by such a program as Boston has adopted. During the winter months, contracts are awarded for pipe, special castings, and machinery, so that delivery is made in whole or in part during the winter months. Contracts for pipe-laying, building foundations, etc., are drawn up during the winter, so that after materials are received, work may be started as soon as the season will permit.

Where it is definitely known that a certain piece of construction is to be carried on next spring, it is highly desirable that arrangements be made and orders given during the winter for the supplies of pipe and other materials that will be needed. This not only has the effect of enabling work to be started as soon as the season will permit, but it has more far-reaching effects in enabling pipe and equipment manufacturers to carry on their work more fully during what is ordinarily an off-season. In the case of cast-iron pipe at least, the winter is the most efficient manufacturing season, and a policy of winter ordering would have far-reaching results.

This is a case for the attention of those immediately in charge of public works of this character and also of those administrative officials who shape the policies of their departments. Some effort is bound to be required to change existing habits, but if the experience of some of these northern cities is a guide, the effort thus spent will have a widespread beneficial effect.

Bandit-Chasing Cars with Bullet-Proof Glass

BANDIT-CHASING cars, manned by policemen with rifles, are now being used by the Department of Public Safety of the city of Philadelphia, in combating the activities of bandits. The cars are equipped with wind-shields and wind-deflectors made of bullet-proof glass, which protect the officers from gun fire. This special bullet-proof glass is made of three pieces of glass with two thin strips of pyralin sheeting cemented between them. The sheeting retards the normal fracture of the glass under the impact of a bullet and there is no shower of flying pieces, but merely a cracking of the glass. Cars equipped in this manner give the police the advantage in a gun-fire chase after bandits and have proved so useful and practical in Philadelphia that a number of other cities are planning to install them soon.

Bullet-proof glass is also being used for windows in bank tellers' cages, theater and moving-picture box offices, pay cars and bank collection cars, where employees who worked behind ordinary glass shields were exposed not only to the hazard of the bandit's bullet crashing through, but also to the hazard of flying glass should a pane be broken accidentally.

To the casual observer this special glass has every appearance and possesses all the visibility of regular window glass.

Radio Fire Hazards at Receiving Stations

By A. C. Huston

Assistant Chief Engineer, The National Board of Fire Underwriters

WITH the introduction and wide use of radio, the general expectation was that aerial antennae stretched from chimneys to posts, from trees to houses and from one part of the building to the other, would provide a most inviting path for the travel of lightning to the house, with the possible consequence that the building would be destroyed and persons would be killed or injured. This applies only to the antennae outside of buildings, since indoor antennae present no lightning hazard.

The experience with telephone and lighting systems was such as to justify the opinion that if proper lightning arresters were installed on the lead-in wires from aerial antennae, little trouble was to be expected. This has proved to be the case with radio installations, as records show that there have been very few cases where the discharge of lightning has resulted in injury to persons or damage to property. There have been infrequent instances where a building with a radio antenna has been struck by lightning and the radio equipment destroyed, but in practically all these cases the installation was faulty in some respect.

It may be said, then, that there need be no fear of increasing the danger of a building's being struck by lightning because of use of an aerial antenna, if it is properly installed and provided with a grounded lightning arrester. There is, however, a very distinct danger from the outside aerials if they are not properly installed with respect to other wires. There have been several cases, notably one in Montclair, N. J., where a defective aerial has come in contact with high-tension electric lines and persons have been killed, or property has been ignited by a short circuit through the building.

This matter is of such moment that cities are justified in requiring that all outside aerials shall be approved by some proper authority after suitable inspection. A number of cities have such requirements, thus preventing the erection of an aerial or lead wire over or near high-power wires or within close proximity to the ordinary commercial lighting wires.

Normally, the aerial and the lead-in wires carry only the induced current of the radio waves and there is no need of using insulated wire. The possibility of a cross with high-tension or the commercial lighting circuit, however, justifies attention to the insulation of the lead-in wire as it is carried around the building.

Fire Hazard of Storage Batteries

The earlier installations, consisting of a simple crystal set well installed, did not have any feature which would, aside from the danger from lightning or a cross with high-tension wires, increase the fire hazard, or lead to a life hazard. The present trend, however, is towards tube sets using storage battery or dry cells of high voltage, or to use the commercial house-lighting circuit. These introduce a distinct fire hazard, as the voltages and current used approach those of the commercial light, which as everyone knows, is a fire hazard if not properly installed. With the storage battery there are usually various charging devices and the necessary wiring to run from the batteries to the instruments.

All of the wiring in connection with batteries should have equal insulation and be as well installed as the ordinary house circuit. Even the ordinary dry cell, if short-circuited in the vicinity of inflammable material, may result in a fire. The storage battery has been one of the most prolific causes of destruction of automobiles, and it may be expected to have a similar record in connection with radio sets, if proper care is not taken to prevent short-circuiting and the consequent heavy discharge of current. The serious possibilities which may result from an attempt to use radio current direct from a lighting circuit are such that it would appear very unwise to use any appliance which had not been thoroughly inspected and tested as to its suitability, and this inspection should be made by some competent agent, such as Underwriters' Laboratories.

In conclusion, it may be said that with the simpler sets there is little fire hazard, beyond that from lightning, or from a cross with high-tension wires, and the danger to life is practically negligible if properly installed. As the higher-powered sets are introduced, the danger from fire and severe shock to individuals becomes greater, and there may be an increasing need for rigid inspection of the installation of these sets and the batteries and other various instruments which go with them, to see that they are installed in full compliance with the regulations of the National Electrical Code.

ACKNOWLEDGMENT.—From a paper read at the Buffalo Convention of the International Association of Fire Engineers, August, 1924.

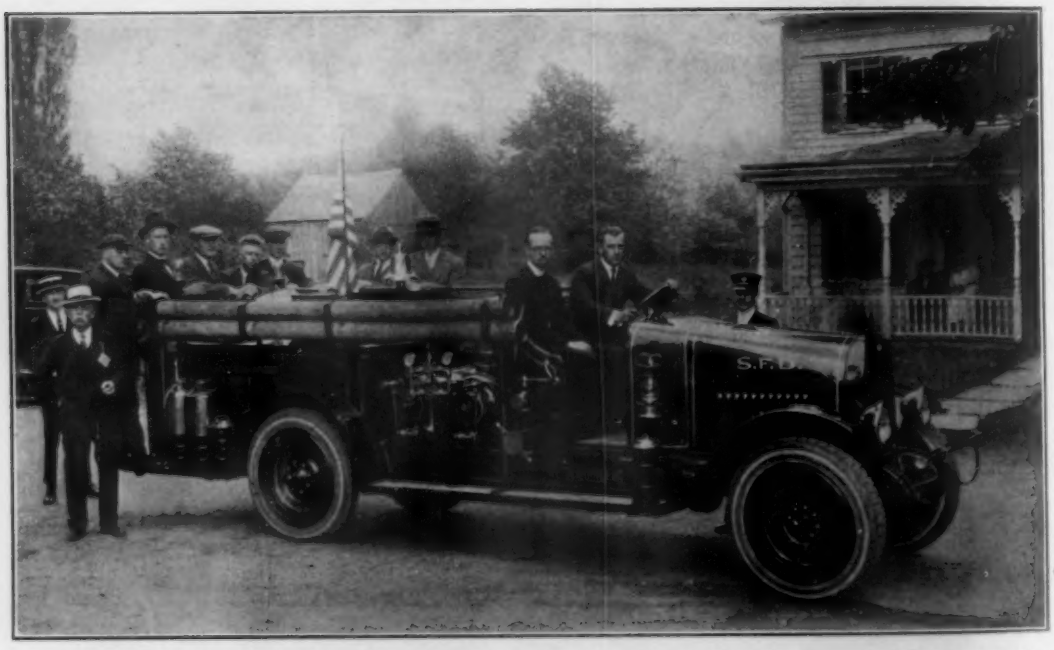
Motor Trucks in Municipal Service and Fire Departments

TWO AMERICAN-LAFRANCE COMMERCIAL TRUCKS IN SERVICE IN BLOOMFIELD, N. J.

The truck on the left is a 2½-ton model, and the one on the right a 5-ton model. These trucks are equipped with special steel bodies for hauling garbage and are also provided with a special attachment in front to enable them to use snow-plows for street-cleaning purposes during the winter

Have You Seriously Considered Snow Removal?

It will soon be too late to formulate a satisfactory plan for the removal of snow from your streets this coming winter. Think it over before the snow arrives, and then emergencies will not arise.



CHILDS TRIPLE-COMBINATION FIRE TRUCK OF THE SPARTA TOWNSHIP FIRE DEPARTMENT, SPARTA, N. J.

This truck is used in a small village and rural township where there are no water-mains or hydrants. Water is drafted from brooks and ponds, which abound, and the 400-gallon pump and two 45-gallon chemical tank afford the best possible protection under local conditions, according to Rev. Edwin S. Ford, Chief, Sparta Township Fire Department, to whom we are indebted for this photograph and information. The Foamite-Childs apparatus is mounted on a Larabee speed chassis. The truck has performed well at a midnight fire which had gained considerable headway before discovery, and negotiates successfully the bad roads and steep hills found in parts of the township

Keeping Down the Up-Keep of Municipal Motor Equipment

The Present Extent of Central Garages in American Cities and the Resultant Savings

By Russell Forbes

Research Secretary, National Association of Purchasing Agents, New York City

CITY government could never have met the demands of its citizens for so highly diversified service without the aid of the automobile. Modern municipal government is to-day "motorized" in practically all of its branches. Automobile power, on account of its greater speed, freedom from fatigue, and greater hauling capacity has almost replaced horse power in many cities.

The number and value of automobiles in use by the municipal industry has increased tremendously during the last decade. The Power Wagon Reference Book, 1923, showed that in 1911 motor trucks were used in only 85 of our cities, and that a total of only 387 were then in operation. In 1920 the number of trucks in use had increased to 7,840. In 1923 over 16,000 were in use in 3,895 cities. The 16,000 trucks represented an investment of almost 31½ million dollars. This does not include other motor equipment now widely employed by city governments, such as street sprinklers and sweepers, ambulances, and passenger cars and busses.*

Each department or branch of a city government at first considered its motor equipment as separate and distinct from that of other departments and insisted upon a separate administration over it. The general public and city officials themselves have of late gained a new conception of a city government as a unit, so that a department in many places no longer considers equipment operated by it as its own exclusive property. This has made possible a centralized control over the motor equipment operated by all departments of a city.

Some cities now operate all their motor cars on a "taxi" basis, whereby an accurate record of mileage cost for each car is maintained, and each using-agency is charged its pro rata share of the expense on a mileage basis. All cars are thus housed at a central point when not in use, and the use of city-owned cars for "joy-riding" by city employees is almost entirely eliminated. Other cities vest the custody of their cars in departments to which they are assigned, but operate a central garage where all city cars are serviced and repaired.

*For an analysis of the uses of motor trucks by municipal departments, see the 1924 *Municipal Index*, Section 5.

Garages in Thirty-One Cities Compared

The writer has been in touch, either by correspondence or by personal visit, with the majority of municipal garages now in operation in this country. The accompanying tables (Figure 1) give a digest of the equipment owned and the system followed in thirty-one cities. Group I compares the system in operation in fourteen of our larger cities, each owning 75 or more motor vehicles. Group II compares seventeen cities each having less than 75 motor vehicles. In all of the cities covered by this report, the motor equipment of the fire department is housed, repaired and serviced separately, either in the fire stations or in some central station under the department's exclusive supervision. The information shown for Newark, N. J., applies only to the Department of Streets and Public Improvements, but this department has charge of more than one-half of all city-owned cars.

In the majority of the cities shown on the digest, the municipal garage is under supervision of a superintendent or foreman who devotes his entire time and attention to the task. In three cities, control of the garage is vested in the city purchasing agent. In two others, the city manager personally supervises. The city of Detroit has a Department of Motor Transportation, of which the municipal garage is a branch. In Bridgeport, Conn., a special Garage Control Commission is composed of the Mayor as chairman, four members of the Board of Aldermen, and four citizens appointed by the Mayor.

In all cities except Birmingham the garage building and site are owned by the city. Eighteen garages are constructed of brick, six of wood, three of sheet metal, and two of concrete. The larger proportion of the buildings are single-story. Detroit's garage is of modern concrete construction, three stories high, and is fire-proof throughout. The floor space

of the building indicates whether or not the garage also houses the cars when not in use. Garages with limited capacity serve only as a central repair and service station.

The majority of garages maintain small stock rooms for extra repair parts. Dayton, Ohio, and Dallas, Texas, are provided with revolving funds to finance purchases of stock in bulk when market conditions are favorable. Some cities located in a manufacturing or distribution center when delivery facilities are good do not stock repair parts in bulk. In some cases, experience has shown that the interest on money invested while stock is stored is equal to, or in excess of, the potential savings of bulk purchases in advance of need.

A central filling station may be a source of considerable economy. Practically every city maintains one, and in some the storage tanks permit purchase of gasoline in tank car lots. This facilitates a saving of several cents per gallon over purchase in retail quantity upon need.

Other Cities Establishing Garages

Other cities are just now establishing centralized control over motor vehicles. Milwaukee is considering such a project for the current year. Dallas has just completed a municipal garage, filling-station, and repair shop to be under the supervision of the city purchasing agent. It is located on a railroad siding with storage tanks for handling car-loads of gasoline. The Board of Estimate and Apportionment of New York City recently appropriated $3,500,000 for the construction of a central

DIGEST OF MUNICIPAL GARAGE SYSTEMS

GROUP I — Cities Owning Seventy-Five or More Cars

City	No. of cars supervised	Year est.	Under supervision of	Type of construction	No. of floors of bldg.	Dimension of bldg.	No. cars capacity	Cost of bldg.	Value of garage equipment	No. of repair men	Stock room: No. of stock compartments	Stock room: Stock handled annually	Filling station: Gas pumps	Filling station: Capacity (gallons)	Filling station: Oil pumps
AKRON, Ohio	75	1920	Purchasing Agent	--	-	-	75	-	$ 5,000	3	500	$ 14,000	6	1200	-
BIRMINGHAM, Ala.	94	1920	Dept. of Garage	Brick	1	100 x 100	100	Rented	1,500	6	225	15,000	1	500	0
BRIDGEPORT, Conn.	110	1920	Gar.Control Comm.	Brick	1	100 x 200	80	$140,000	6,500	12	150	19,000	2	1500	0
CAMDEN, N. J.	97	1918	Mun. Motor Dept.	Brick	2	87 x 112	-	11,960	5,000	10	50	--	1	800	0
CINCINNATI, Ohio	97	1912	Dept.Pub.Property	Brick	2	70 x 140	91	95,000	1,000	6	600 plus 124 tire & tube bins	6,000	1	500	1
DAYTON, Ohio	98	1915	Dept. Motor Veh.	--	2	60 x 200	55	--	--	11	--	--	-	-	-
DETROIT, Mich.	911	1913	Dept.Motor Trans.	Concrete	2	200 x 481	550	$96,000	120,000	75	15,000	800,000	7	450	0
HOUSTON, Texas	110	1921	City Manager	Sheet metal	1	40 x 100	-	--	--	4	Limited stock of parts		1	500	1
NEWARK, N. J.	150	1918	Dept. Sts. & Pub.Improvement	Brick	2	55 x 120	75	39,000	7,000	10	800	70,000	2	1500	1
NORFOLK, Va.	118	1919	City Pur. Agent	Wood	1	44 x 170	116	1,000	5,000	7	250	5,500	2	4000	0
OAKLAND, Calif.	149	1913	Dept. of Garage	Wood	1	41 x 72	-	--	7,000	23	1200	35,000	2	500	2
PITTSBURGH, Pa.	196	1919	Dept. of Mayor	Brick	2	100 x 270	270	--	35,000	19	800	80,000	2	600	4
ST. LOUIS, Mo.	180	1911	Dept. of Garage	Brick	2	110 x 180	95	--	--	10	--	--	1	1200	4
ST. PAUL, Minn.	118	1914	Dept.Pub.Safety	Concrete	2	40 x 154	-	80,000	10,000	4	650	6,000	2	600	-

GROUP II — Cities Owning Less Than Seventy-Five Cars

CHARLOTTESVILLE, Virginia	19	1923	Dept. of Garage	Wood	1	-	-	--	2,000	2	--	2,000	1	500	1
DAVENPORT, Iowa	48	1920	Dept. of Garage	Brick	1	30 x 140	55	12,000	4,000	3	--	--	1	550	1
DUBUQUE, Iowa	25	1922	Dept. of Garage	Brick	1	60 x 140	96	21,000	--	2	--	--	1	600	1
EDMONTON, Alberta	45	1919	Dept. of Garage	Brick	1	60 x 95	59	10,000	--	2	--	--	1	540	-
ESCANABA, Michigan	30	1920	Storekeeper	Brick	1	40 x 100	8	--	2,420	1	--	--	2	400	2
GLENDALE, Calif.	49	--	Dept. of Garage	Sheet metal	1	80 x 64	-	--	1,000	-	750	4,000	1	800	2
HAMILTON, Ontario	47	1918	Dept. of Garage	Brick	2	40 x 140	17	10,000	3,000	3	--	--	1	1000	2
HIGHLAND PARK, Mich.	40	--	Dept.Pub.Service	Wood	1	-	55	--	--	2	--	--	2	1000	4
LIMA, Ohio	55	1922	Dept. Pub. Works	Brick	1	-	-	--	--	2	--	--	2	550	2
MUSKEGON, Michigan	21	1920	--	Wood	1	-	21	--	2,000	2	--	--	1	500	1
PETERSBURG, Va.	19	1923	Dept. of Garage	Wood	1	60 x 90	22	2,000	4,000	2	4	18,000	2	500	4
PHOENIX, Arizona	40	1918	Garage Foreman	Sheet metal	1	80 x 80	55	--	2,000	4	--	--	2	1000	-
PONTIAC, Michigan	29	1921	City Engineer	Brick	1	60 x 80	40	4,000	800	2	50	--	1	550	2
READING, Pa.	18	1909	Dept. of Garage	Brick	½	60 x 80	18	--	--	2	90	6,000	2	600	1
SANTA BARBARA, Calif.	97	1918	City Pur. Agent	Brick	1	40 x 180	-	6,500	3,048	4	800	35,000	2	600	2
SAULT STE. MARIE, Michigan	8	1921	City Manager	Brick	1	60 x 80	40	12,000	500	2	150	7,500	1	500	-
VANCOUVER, B. C.	41	1923	Garage Foreman	Brick	1	150 x 120	-	35,000	3,000	2	600	1,000	1	500	2

Explanations

Akron, Ohio	Central garage only for Eng., Health and Police Departments.
Birmingham, Alabama	Street and fire equipment under separate custody.
Bridgeport, Conn.	Garage control commission is composed of five aldermen and four appointees of Mayor, who is chairman.
Cincinnati, Ohio	Depts. of Safety, Water Works, and Parks house and repair cars separately.
Houston, Texas	Police Dept. cars housed separately.
Newark, N. J.	Includes motor equipment of Depts. of Streets and Public Improvements only. (About ½ total city motor equipment.)
Santa Barbara Calif.	Garage and city storehouse combined.
Vancouver, B. C.	Equipment of school, fire, and police departments not included.

FIGURE 1

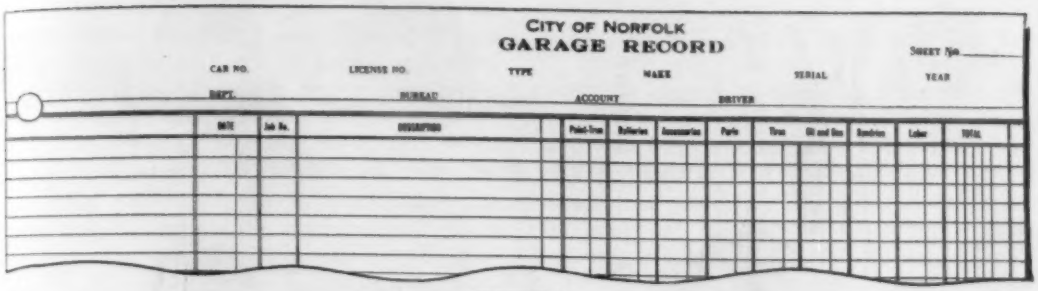

CITY OF NORFOLK
GARAGE RECORD
SHEET No.
CAR NO. LICENSE NO. TYPE MAKE SERIAL YEAR
DEPT. BUREAU ACCOUNT DRIVER
DATE Job No. DESCRIPTION Paint-Trim Batteries Accessories Parts Tires Oil and Gas Sundries Labor TOTAL

FIGURE 2

motor repair shop, to be under the supervision of the Department of Street Cleaning, but available for use by all departments of the city government. Nineteen departments, operating in all over 3,000 vehicles, urged the appropriation for a central repair shop to supersede the 28 shops at present controlled by them and now scattered throughout the city. Central control over automotive equipment is a "going" subject in municipal government today.

Representative Systems of Administration

The writer has had opportunity to inspect personally several different systems of administration of municipal garages in the cities covered in this report. The city of Norfolk, Va., operates 118 motor cars through the municipal garage under supervision of the city purchasing department. An accurate cost record is kept for each car during each current fiscal year and for its entire life. Each car is assigned a page in the accounting ledger. The *repair card* reproduced herewith (*Figure* 3) allocates the repair cost of the specific car, to its using department, and to its operator. This serves as an index to the efficiency of each driver and checks carelessness. The card is certified by the timekeeper, by the garage foreman, and by the head of the department ordering the repair.

The *garage record* (Figure 2) constitutes each car's expense account with the city. The job number ties up each entry with its repair card, which is duly certified by the proper authorities. Expenses are allocated to paint-trim, batteries, accessories, parts, tires, oil and gas, sundries, and labor. The total column shows at a glance the total up-keep cost for each car to date in the fiscal year. It indicates when a car has served its usefulness and should be traded in or replaced.

The municipal garage of Birmingham, Ala., exercises even closer control over the city's motor equipment. All cars, except those of the street and fire departments, are housed in

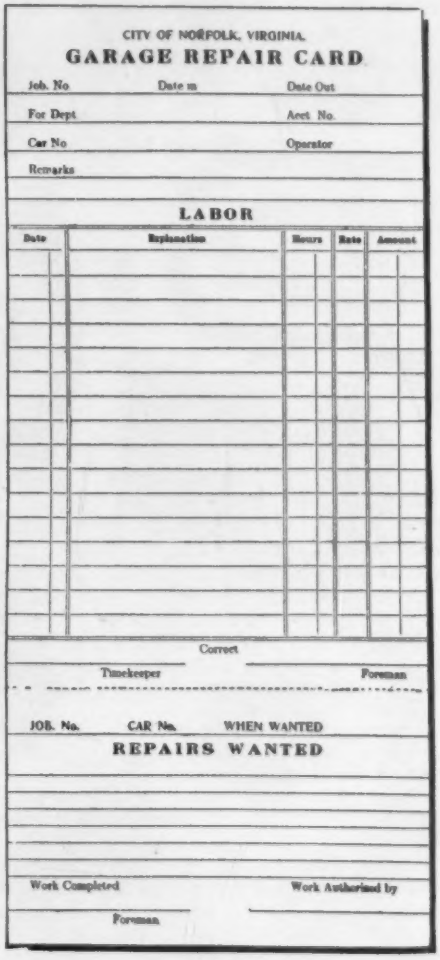

CITY OF NORFOLK, VIRGINIA.
GARAGE REPAIR CARD
Job. No. Date in Date Out
For Dept. Acct. No.
Car No. Operator
Remarks
LABOR
Date Explanation Hours Rate Amount
Correct
Timekeeper Foreman
JOB. No. CAR No. WHEN WANTED
REPAIRS WANTED
Work Completed Work Authorized by
Foreman

FIGURE 3

the municipal garage when not in use. Each car "punches out" in the morning and "punches in" at night. The garage keeps a daily report of all city-owned cars. The car is identified by its number and by the department to which it is assigned. The speedometer reading is taken when the car leaves and again when it returns, and the mileage is recorded, as well as the gas and oil issued to it. Each driver reports on a regular form any trouble noted

or repair needed. A cost ledger sheet is kept for each car, as at Norfolk, and the up-keep is charged to the respective departments. A flat rate of $1 per hour is charged for repair work, which covers salaries, overhead charges for operation of garage, and all expenses other than repair material, which is charged extra. A report is made on each battery every ten days. Every car is inspected daily and serviced by an attendant at night, who also acts as watchman. Repair parts are kept in a small storeroom, which is financed from a municipal stores revolving fund. During the past year an amount equal to the pay-roll of the garage was saved in wholesale discounts on Ford parts alone.

In the city of Houston, Texas, the municipal garage is operated under direct supervision of the city manager. A total of 110 cars are operated out of the garage, which includes all belonging to the city except those of the police and fire departments. Two mechanics and one helper are on the pay-roll. The garage was operated last year for an average monthly cost of $372, which included salaries and overhead. By conducting a central filling-station, gasoline and oil are purchased in large quantities at wholesale prices, for an average saving of 4 cents per gallon on gasoline and 50 cents per gallon on lubricating oil. Tubes are vulcanized at an average cost of 3 cents per job. To recharge a battery costs the city on an average of 20 cents. To rebuild a battery costs about $9, while commercial concerns make an average charge of $16 per job. The municipal garage was constructed under a viaduct at a cost almost negligible. Its operation means an estimated annual saving to the city of over $20,000 by reducing repair and housing cost, by encouraging greater care in driving and in maintenance, and by eliminating "joy-riding" at the city's expense through a strict surveillance of mileage.

This is the "motor age" in city government. The cost of motor equipment and the expense of its maintenance is a considerable item in the annual budget of most cities to-day. The success already attained by several cities demonstrates that centralized control over motor equipment is a leading means for keeping the up-keep down.

ACKNOWLEDGMENT.—For the foregoing article THE AMERICAN CITY is indebted to *The Purchasing Agent*, which is publishing the same material in its October issue.

There Were Speeders Even in Those Days

THE problem of fast traffic is by no means a new one. Those who have been to Pompeii are acquainted with the blocks across the streets which served the double purpose of keeping the chariots to a reasonable pace and the feet of the pedestrians dry when they crossed the road. In this country, a Newport correspondent claims for Rhode Island the credit of having been the first to pass a traffic ordinance. This occurred in June, 1678, the resolution of the Assembly of the Colony reading as follows:

"Whereas, there was very lately in the town of Newport on Rhode Island very great hurte done to a small childe by reason of exceeding fast and hard ridinge of horses in said town, this Assembly takeing the matter into their searious consideration and being desirous for the future to prevent the like mischief, doe ordain, et cetera——that from and after the publication hereof, if any person or persons shall presume to ride on either horse, mare or gelding, a gallup or to run speed—in the streets of Newport—said person shall for his offence pay—unto the Treasurer of said towne 5 shillings in money on demand; 2 shillings of which shall be paid to any person or persons that shall give information thereof and the other 3 shillings to remaine for the use of the said towne."

And the Town Sergeant was immediately empowered by a special act to "take by distraint" the said 5 shillings if they were not immediately forthcoming.

It has been said that the curse of America is the desire for speed. If this is so, the curse is of ancient lineage. If barely 70 years after the first permanent settlement on our shores it was found necessary to legislate against "speed fiends," their currency to-day should not surprise us.

Road Mileage in the United States

THERE are now in the United States, according to the Federal Bureau of Public Roads, a total of 2,819,386 miles of rural highways. As nearly as it is possible to determine, the mileage of the various types of pavements is as follows: gravel, 175,000 miles; macadam, 100,000 miles; sheet asphalt, asphaltic concrete, asphalt block and asphalt macadam, 30,000 miles; portland cement concrete, 27,000 miles; brick, stone block and miscellaneous, 10,000 miles. Exclusive of sand-clay roads, there are now 340,000 miles of paved highways. Forty thousand miles of paved roads were constructed last year. The construction of asphalt roads during 1923 was greatly in excess of any previous year, there being laid 102,000,000 square yards of asphalt paving on the roads and streets of the country, compared to 82,700,000 square yards in 1922, and 68,000,000 square yards in 1921. The increase in the asphaltic types is due, according to the engineers, to recognition of the shock-absorbing and waterproofing characteristics of asphaltic compositions, which protect foundations from the impact of traffic and give them immunity from destruction through moisture and temperature changes at all times of the year.

Combining Traffic and Patrol Service Without Increasing the Pay-Roll

By William A. Douglas
Commissioner of Public Safety, Utica, N. Y.

MODERN methods and more police efficiency per man are needed in many cities to cope with the modern criminal and with the reckless motorist, who is just as deadly and who scores more frequently than the gunman. Utica has recently witnessed within its paved circumference some highway crimes of a violent character made possible by the extension of its park system into an area without adequate police patrol. The problem was to increase the efficiency of the individual officer without adding numerical strength beyond the city's resources and without establishing a fully manned and costly precinct system. During the last six months, these problems in Utica have been solved or are in the process of solution.

The paved area encircling the city of Utica has a length of about eighteen miles. To shelter motor-cycle officers engaged on boundary patrol, outposts or stations of tapestry brick construction and ornamental design, ten feet square and ten feet high to peak of roof, have been located at a fraction more than three miles apart at strategic points. Gold lettering on blue background identifies them to the passing public as "Police Motor Patrol." Each station has a desk, a chair, a police blotter, an electric light, an electric heater, and a telephone having no direct communication other than with headquarters.

POLICE MOTOR PATROL STATION
The motor-cycles used are of three makes: Harley-Davidson, Indian and Henderson

The station is occupied during daylight hours by a foot patrolman. The night patrol begins moving at eight o'clock and the system calls for a motor-cycle officer at each station at that hour. At the same hour, a sixth motor-cycle officer reports at station 1 and begins a tour of the city boundary. He passes each station and reports to headquarters from each of the five occupied stations during the hour needed for the tour of the city's circumference. He then finishes his tour one station beyond the complete circle, there relieving the motor-cycle officer at station 2, The motor officer at station 2 thereupon resumes the boundary patrol, passing and reporting as before, and ending his tour at station 3, where the patrol is resumed by the motor officer at that station, thus rotating and relieving each officer in turn during the night hours. City streets paralleling the boundary line and within measurable distance are also covered by the motor patrol, thus relieving foot patrolmen in the outlying districts for work nearer the congested parts of the city's night life.

The system provides immediate communication between headquarters and each avenue of escape from the city. Telephone wires between patrol stations and headquarters are buried in cable conduits, thus protecting the wire service from outside attack. So far as the writer can learn, Utica is the only city having a boundary motor patrol in operation.

The time when our residential neighbor went to his front gate to hail a blue uniform has passed and the value of the daylight patrolman in residential districts has passed with it. Calls for police service in our generation

are telephone calls direct to headquarters, and the problem is to dispatch prompt relief. A reserve force at headquarters is not always available to answer the many daylight complaints, mostly of a trivial nature, in the residential sections. Under the old system, the foot patrolman on the beat may be a mile or more from a police box, and the complaint reaches him when he rings in a half hour or more later. Under the new system which is being installed in Utica, the patrolling officer is stationed in daylight at the busiest street intersection on his beat. He thus becomes a traffic officer, but at this same point is a signal whereby he can be reached instantly from headquarters and given complaints to answer from any part of his beat. This combines traffic service and quick patrol service, and doubles the output of the individual police officer without increasing the police pay-roll.

Another minor detail of police service, much appreciated by the trolley traveling public, has been adopted in Utica between the hours of five and seven o'clock in the evening at busy street intersections in residential districts where trolleys are discharging passengers returning from work. This consists of the holding back by the patrolman of motor traffic at safety zones until cleared of passengers, it being self-evident that the sidewalk is the real safety zone and the quicker the pedestrian is out of the traffic area the quicker he is out of danger.

Personal Liability of Health Officials

By James A. Tobey, M. S., LL.B.

Administrative Secretary, National Health Council, New York

PUBLIC officials are often concerned about the extent of their own personal liability for acts done in the course of their official duties. In many states legislation governing such liability is in existence, and public officials should, of course, familiarize themselves with it. The courts have also rendered numerous decisions on this subject, and these express the law. It is the function of the courts to interpret and secure justice under the laws as promulgated by the legislative branch of government and enforced by the executive. The courts can render opinions, however, only in cases actually brought before them by aggrieved persons. Where there is no legislation, the principles of the common law are applied.

Officers of a municipal corporation are not liable, according to Dillon,[1] for errors or mistakes of judgment in the performance of acts within the scope of their authority as to which they are empowered to exercise judgment and discretion in the manner of their performance, in the absence of malice or corruption or a statutory provision imposing the liability. The following discussion is concerned primarily with health officials, but the principles involved apply with equal force to other officials acting in a governmental capacity.

A health official is an administrative or ministerial officer, the agent of the government he represents, and as such has many quasi-judicial functions. He cannot be held individually liable for any act which is essential for the protection of the health of the public, but in performing his duties he must be reasonable and prudent. For a mere error of judgment he will not be held liable, but if he is unreasonable, arbitrary, oppressive, or malicious in doing his work and thus causes injuries to persons, or property, he will be liable.[2]

As an example of a reasonable exercise of power by a health officer, there may be cited mistakes of quarantine. Where an individual was isolated under the belief that he had smallpox, though as a matter of fact he did not have it, members of the local board of health were held by the highest court of Iowa not to be liable for this error.[3] So too, a health officer in New Jersey was held not personally liable for quarantining for scarlet fever after four physicians had diagnosed it as such, though it turned out not to be this disease.[4]

An early (1874) Maine case held that an owner could not recover from a health officer who had compelled him to remove the wallpaper from a room where a smallpox patient had been confined, although considerable evidence was introduced to the effect that such removal was unnecessary.[5] It is possible that

[1] Dillon's "Municipal Corporations," page 771.

[2] Crayton v. Larabee, 220 N. Y. 493, 116 N. E. 355, L. R. A. 1918 E. 432. Bellows v. Raynor, 207 N. Y. 389, 101 N. E. 181. Raymond v. Fish, 51 Conn. 80, 50 Am. R. 2. See also note, 24 A. L. R. 794.

[3] Beeks v. Dickenson County, 131 Ia. 444, 108 N. W. 311, 6 L. R. A. (N. S.) 831, 9 Ann. Cas. 812.

[4] Valentine v. Englewood, 76 N. J. L. 509, 71 Atl. 344, 19 L. R. A. (N. S.) 262, 16 Ann. Cas. 731, and see Forbes v. Escambia County Board of Health, 28 Fla. 26, 9 So. 862, 13 L. R. A. 549.

such a requirement to-day, in light of our modern knowledge, would be held unreasonable. However, the general rule of law would be the same.

Other cases have held no liability for failure to remove a smallpox patient from a house,[6] for quarantine of a vessel on account of the prevalence of disease at the port,[7] for fumigating a millinery shop,[8] for failure to provide a nurse as required by law,[9] and for the exclusion of an unvaccinated child from school.[10] So, too, where a health officer merely carries out the orders of his board he is not liable.[11] But where a health officer was negligent in quarantining patients in a tent in cold, damp weather, so as to aggravate their disease and cause death, he is liable.[12] In a recent Kansas case, it was said by the Court: "The law, no less than humanity, requires humane and decent treatment of those who must be segregated from their usual conveniences and friends, and whoever acts with utter disregard of this requirement renders himself liable."[13]

When a health officer does acts in excess of his authority, he is generally liable as an individual. For instance, a recent (1921) Michigan case held that a health officer was liable in damages for causing a girl to be examined for venereal disease, although he did not have reasonable grounds for believing that she was infected. It turned out, as a matter of fact, that she did have gonorrhea, but the court maintained that there was no legal justification for the examination, as there was no testimony showing good faith on the part of the health officer.[14] A president of a board of health was held personally liable for arbitrarily ordering fumigation of a vessel, although it had a clean bill of health and had not come from an infected port.[15] Health officials have also been held liable for injuries during the unauthorized use of a dwelling as a hospital,[16] for unwarranted flooding of land,[17] and for neglect in preventing the sale of impure milk.[18]

When a health officer destroys property under the belief that it may be dangerous to health, but as a matter of fact, it is not and could by no means be reasonably so considered, he is liable.[19] As was remarked in a New York case, "Whoever abates a nuisance, unless acting under court order, does so at his peril and must prove the nuisance."[20] In 1890 in Massachusetts, the members of a board of health ordered certain horses to be killed on the supposition that they had glanders. It turned out that they did not have this disease, and the members were held liable. It was their business to ascertain the exact facts and they were negligent in not doing so.[21] In a similar connection, live stock commissioners were liable for the destruction of healthy cattle by mistake.[22]

Health officers, like all other public officers, are not ordinarily individually responsible for the negligence of those whom they are obliged to employ. If, however, the fault of the subordinate is due to the connivance of the superior, the latter may be held liable. The health officer is never personally liable for contracts which he is authorized to make, and is not liable on *ultra vires* contracts, provided there is no fraud or actual deception.[23] It is a well-known rule of law that the municipality itself is never liable for the acts of its officers when performing governmental functions.

[5] Seavey v. Preble, 64 Me. 120.
[6] Whidden v. Cheever, 69 N. H. 142, 44 Atl. 908, 76 Am. S. R. 154.
[7] Compagnie Française de Navigation a Vapeur v. State Board of Health, 51 La. Ann. 645, 25 So. 591, 56 L. R. A. 795, 72 Am. S. R. 458.
[8] Allison v. Cash, 143 Ky. 679, 137 S. W. 245.
[9] Rohn v. Osmun, 143 Mich. 68, 106 N. W. 697, 5 L. R. A. (N. S.) 635.
[10] Zucht v. King, 225 S. W. 267, affirmed 260 U. S. 174.
[11] Kirby v. Harker, 143 Ia. 478, 121 N. W. 1071.
[12] Aaron v. Broiles, 64 Tex. 316, 53 Am. Rep. 764.
[13] Moody v. Wickersham, 111 Kan. 770, 207 P. 847, 24 A. L. R. 794.
[14] Rock v. Carney, 216 Mich. 280, 185 N. W. 798, 22 A. L. R. 1178.
[15] Beers v. Board of Health, 25 La. Ann. 1132, 48 Am. Rep. 256.
[16] Brown v. Murdock, 140 Mass. 314, 3 N. E. 208; Hersey v. Chapin, 162 Mass. 176, 38 N. E. 442; Barry v. Smith, 191 Mass. 78, 77 N. E. 1099, 5 L. R. A. (N. S.) 1028. But no liability where owner executes a lease: Sallinger v. Smith, 192 Mass. 317, 78 N. E. 479.
[17] Overmyer v. Barnett, 70 Ind. App. 569, 123 N. E. 654.
[18] McKenzie v. Royal Dairy, 35 Wash. 390.
[19] Lowe v. Conroy, 120 Wis. 151, 97 N. W. 942, 66 L. R. A. 907, 102 Am. S. R. 983, 1 Ann. Cas. 341.
[20] People ex rel. Copcutt v. Board of Health, 140 N. Y. 1, 35 N. E. 320, 23 L. R. A. 481, 37 Am. S. R. 522.
[21] Miller v. Horton, 152 Mass. 540, 26 N. E. 100, 10 L. R. A. 116, 23 Am. S. R. 850.
[22] Pearson v. Zehr, 138 Ill. 48, 29 N. E. 854, 32 Am. S. R. 113.
[23] 1 Dillon, Municipal Corporations, 776.

THIS MAGAZINE IS NOT COPYRIGHTED

Other publications may quote from THE AMERICAN CITY if credit is given.

Pictures Arouse City Planning Emulation

TYPE OF BUILDINGS THAT PROPOSED STREET BETWEEN MAIN STREET AND COLUMBUS AVENUE, SPRINGFIELD, WOULD GO THROUGH

THE PROPOSED STREET WOULD MAKE A WONDERFUL APPROACH TO SPRINGFIELD'S CAMPANILE

SPRINGFIELD NOW GETS NO VISTA OF THE CAMPANILE

SKETCH SHOWING VISTA IF PROJECT IS CARRIED OUT

THE recently published City Plan for Springfield, Mass., is an excellent example of the effective use of local pictures and maps, in combination with views from other cities, to stimulate public approval of a city planning program.

The report consists of thirteen chapters, each of which contains numerous definite recommendations as to procedure. These chapter headings are: The Plan; Building Zones (Municipal Control of the Use of Private Property); Railroads; Thoroughfares and Parkways; Transit, Street Cars and Busses; Downtown Traffic; Water-Front Development; Parks and Reservations; Playgrounds and Recreation; Distribution of Schools and Other Public Buildings; Civic Center; Civic, Educational, and Art Center; Tax Equalization.

In making available for the readers of THE AMERICAN CITY the half-tone illustrations here shown, J. T. Woodruff, Engineer-Secretary of the Planning Board, cites the following important accomplishments *since the printing of the report:*

PARKS

Oak Grove Park purchased, 221 acres.

Mill River Park.—Part of this land near Locust Street given for park.

Eastern Extension of Forest Park.—About 48 acres given to city for park.

Watershops Pond Park.—About 600 feet frontage given to city as start of this project.

Atwater Park.—108 acres given to city. Now pending action of Chicopee City Government.

Dimmock Pond Park.—Given for park by Ludlow Manufacturing Associates.

PARKWAYS

Riverfront Parkway.—Appropriation passed for acquisition of land from Chicopee to West Street, a distance of about one mile, or nearly one-quarter of whole river frontage.

Garland Terrace, Gifford Street and Winnipeg Street Parkway.—This street layout accepted by Board of Survey and plans filed.

Pearl Street to Bridge Street diagonal cut-off and widening.

THOROUGHFARE EXTENSIONS

Extension of Plumtree Road to Wilbraham Road.

State Street widening of roadway, Main to Chestnut Street.

Chestnut Street widening from Taylor to Lyman Street.

Winter Street to be extended.

Building line on Oakland Street, Belmont Avenue to Allen Street.

Downtown traffic control by one-way street method, as shown in Chapter VI, adopted by city and in effect.

Corners of Orange and Oakland Streets cut back and rounded to lessen accident danger.

SCHOOLS

New school to be erected near Hancock and Hickory Streets.

New $225,000 Central Street Junior High School project abandoned because Planning Board study showed it to be unnecessary.

FIRE-STATIONS

New fire-station located and under construction in high-value district.

THAMES, LONDON, RIVER FRONT

A RIVER WALL AT BUDAPEST

THE RIVER FRONT AS A SETTING FOR PUBLIC BUILDINGS

RIVER FRONT PROMENADE, BUDAPEST

PLEASURE USE OF THAMES AT HAMPTON COURT, LONDON

A PLAN EXECUTED—PRAGUE FROM THE RIVER

A RIVER WALL IN PARIS

A RIVER FRONT PROMENADE AT BRATSLAV

For the illustrations on this and the preceding page, THE AMERICAN CITY *is indebted to the Planning Board of Springfield, Mass.; Technical Advisory Corporation, consulting engineers; Frederick Law Olmsted, special adviser*

Forward Steps in City and County

New Municipal Building Houses Town and Village Offices and Police and Fire Departments

ST. JOHNSBURY, VT.—This village of some 7,000 population, now in its second year under a municipal manager, has erected a municipal building costing $53,000 exclusive of the land. It is a two-story brick structure of fire-proof construction, with reinforced concrete and granite trimmings. The ground dimensions are 60 by 75 feet and the lot was bought for $15,000.

The northern half of the building is devoted entirely to the fire department, whose equipment consists of a motor chemical truck, a motor hook and ladder truck, and a motor truck for surplus hose. The big room on the first floor has a floor of reinforced cement, the doors open automatically, and in the rear of the room is the office of the chief. On the second floor is a large recreation room, measuring about 30 x 60 feet, for the paid department of six members, with a pool table, a victrola, easy chairs and the current magazines. In the center of this room is the brass pole so essential for a quick getaway. In the rear are the sleeping quarters, equipped with shower-baths and all modern conveniences.

ST. JOHNSBURY'S NEW MUNICIPAL BUILDING

The south side of the first floor is occupied by the town clerk and treasurer and his two assistants. Here there is a fire-proof vault, 12 x 16 feet and 20 feet high, built of reinforced concrete and solid steel. Back of these offices are the police headquarters. The village lock-up has been given up and now all prisoners are kept in the county jail only a short distance from the municipal building.

A broad stairway at the front and on the right of the first floor corridor leads to the second floor, where are the offices of Town Manager Ralph D. Sherry, a room for the Red Cross, and several suites of offices, one of which has already been rented for commercial purposes. The basement contains the heating apparatus, a spare vault for storing town records which extend back nearly 150 years, and a large room for drying the fire hose.

Aside from the big room containing the fire apparatus, the interior is finished in hard pine stained to represent gumwood, with hardwood floors.

Before the municipal building was erected, the police headquarters were in one portion of the village, the fire department on leased land in another place, and the town and village offices in a third block. Now they are all under one roof in a building which is a credit to the community.

ARTHUR F. STONE.

Warehouse Rehabilitated as Municipal Building

LYNCHBURG, VA.—Prior to the year 1923 the municipal offices of Lynchburg were situated in several widely scattered locations throughout the city—with obvious disadvantages, especially in costly maintenance and in lack of co-ordination.

Thirty-four years ago nearly one-half of a city block, known as the Friends Warehouse property, was purchased by the city and used for a storage and junk yard. Later, part of the property was used as a fire station and the rest was rented. The erection of a city hall on this property has been occasionally agitated since that time.

Recently Lynchburg adopted the city manager form of government, and its affairs have been administered on a strictly conservative basis. Although a yearly construction program of about a quarter-million dollars has been carried out, this along with general operating expenses has been financed from current revenues. This condition is mentioned to give the proper slant on Lynchburg's mental attitude.

Advocates of a costly municipal building were confronted with the question of whether the city would be justified in issuing several hundred thousand dollars of bonds for such a structure, and by so doing increase the annual outlays some $15,000 to $25,000 to provide interest and upkeep, aside from sinking fund requirements; or whether there was justification for curtailing a much-needed program of street, sewer and sidewalk improvements, which would be necessary were such a project financed from current revenues.

Instead of adopting either alternative, it was decided, on recommendation of the City Manager, to rehabilitate the old Friends Warehouse. Accordingly, plans were drawn up and work commenced late in November, 1922. Construction was sufficiently completed to permit all administrative offices, except the Public Welfare and Police De-

FRIENDS WAREHOUSE AND FIRE STATION NO. 3, LYNCHBURG, VA., BEFORE ALTERATION

THE COMPLETED MUNICIPAL BUILDING IN LYNCHBURG

partments, to occupy the new quarters in February following. The No. 3 Fire Station was also completely remodelled, the basement of which, formerly a storage cellar, blacksmith shop and junk yard, now houses the Municipal Court, several offices and the detention cells.

Plans for the two-story building were prepared by a local architect. A local contractor furnished his labor organization and equipment. All materials were furnished by the city, and the construction was supervised by the Department of Public Works.

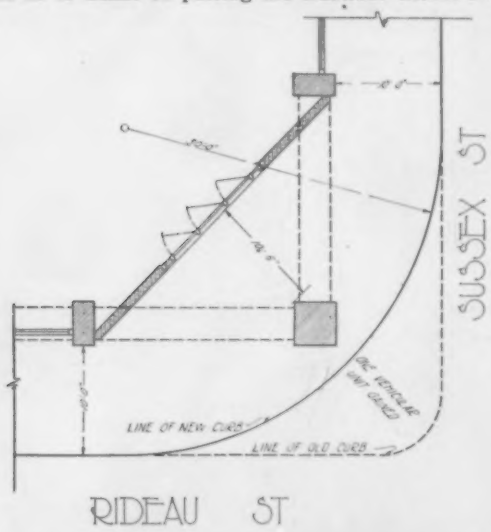
Besides the boiler- and fuel-rooms, fire-proof vaults, battery room and fire- and police-signal room, over forty other offices have been provided.

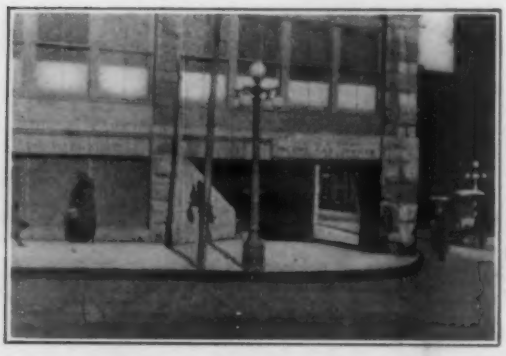
R. W. B. HART,
Director of Public Works.

Rounding of Business Corners to Provide Traffic Relief

OTTAWA, ONT.—A difficult situation, herewith illustrated, at the corner of Rideau and Sussex Streets, Ottawa, may be of interest to town planners and civic authorities. In this case, a very much needed widening of a traffic artery could be obtained only by bringing the curb up to the corner pier of the Daly Building.

Arrangements were made to obtain alterations in the building on the ground floor at this corner, so as to admit of passing the sidewalk within the building, behind the corner pier. The result has proved very satisfactory and the work has not been expensive, comparatively speaking.





CORNER ROUNDED BY PASSING SIDEWALK WITHIN THE BUILDING

The method adopted was the only means whereby this improvement could be obtained short of the enormous expenditure of expropriating the corner of a large office building. The Ottawa Plan Commission has other business corners in view for similar treatment, some of which are under negotiation.

Work of this kind, as a beginning of town planning relief, is proving of great value in convincing the business element of the city that town planning is a practical and economic method of advancing business interests, as well as making the town a better place for home interests and values.

In all new subdivisions of land the Ottawa Plan Commission is insisting upon provisions being made in the layout for the rounding of corners.

JOHN M. KITCHEN,
Office of Town Planning Commission, City Hall.

A Traffic School for Violators of Traffic Rules

KANSAS CITY, KANS.—In the summer of 1923 this city was hit by an epidemic known as the "speed craze." Hundreds of people were brought into the police court and fined, with practically no results. One day a young man came to my office wanting to know what he had been fined for. His attention was called to a certain section of the city ordinance, and a pamphlet containing the ordinance was handed him to read. He asked for permission to take the pamphlet with him. I then concluded that hundreds of speeders violated the ordinance, not through wilfulness, but through ignorance. This suggested the idea of getting as many people as possible to read the ordinances. When a speeder was brought into court, and when after hearing the evidence I found that no one was injured nor any property damage sustained and that the violation was the result of ignorance, I would continue the speeder's case for a week or ten days. During that period I would require the speeder to look up the statistics on insurance rates, the number of people killed and injured, the number confined in hospitals, the amount of money spent for graves and funerals, and would give him a pamphlet containing the traffic ordinance to study. When his case was again set for trial, he would be required to give me the information requested, and, under the instruction of a member of the Legal Department of the city, pass an examination on the ordinance. If it was shown that he had a clear conception of the ordinance and realized the seriousness of the situation, he would either be fined and paroled or his case continued pending good behavior.

On one occasion a traffic student, after passing a good examination, suggested that all violators be required to direct traffic under the supervision of a traffic officer. This was done, and as a result I was given a number of valuable ideas, from which I prepared for the press a list of "don'ts" for car drivers and pedestrians, which, together with the ordinance, were taught in the schools of this city.

The results, though not an absolute cure, have proved very satisfactory. I dare say there are more people in Kansas City, Kans. (120,000), who know the traffic ordinance and the responsibility of the car driver than in any other city of its size in the United States. During 1924 we have not had

nearly the trouble with speeders that we had in 1923. Then all three of our metropolitan papers carried daily stories on the speeders and traffic violators; to-day two of the papers scarcely make any mention of the subject.

H. S. ROBERTS,
Police Judge.

Electrocution of Stray Dogs

To the Editor of THE AMERICAN CITY:

I notice in your August issue a little article on "A Proposed Municipal Program for Rabies Control."

We have a method here that we believe to be the first of its kind anywhere; I am quite sure it is the first of its kind in Georgia. We recently passed a very stringent dog ordinance, requiring all dogs to be inoculated against rabies and tagged. After a certain date all dogs caught without tags are sent to the city pound for dogs, held there four days, and then killed unless claimed by the owner. We have developed a unique method of impounding and killing. We built a pound with five compartments having concrete floors and well constructed. Each compartment has a tag and number; number five each day is the compartment containing dogs to be killed.

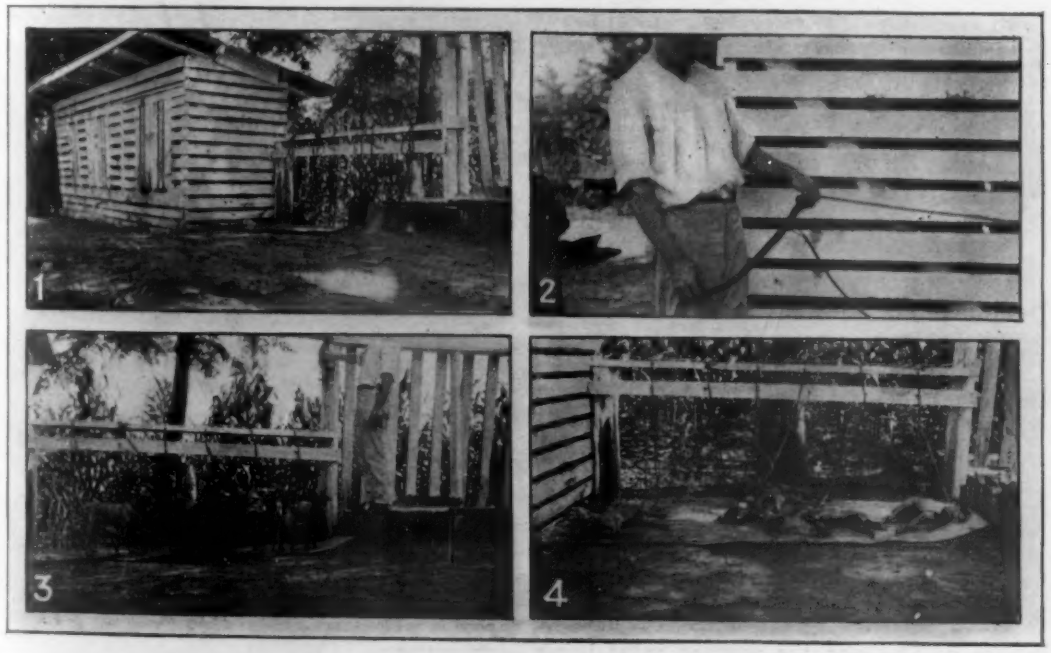
After some experimentation with the injection of strychnine and other poisons, we decided that electrocution was the quickest, most effective and least painful method of killing. We devised what might be called an electric chair of sufficient size to accommodate six dogs at a time. This device, developed by H. A. Miller, consists of a collar of copper brads that extend just far enough to make contact with the hide of the dog. The dog is wet with a garden hose just before the collar is clamped on, and stands on a metal sheet when the current is applied. Mr. Miller claims that the operation takes 1-180 millionth of a second to kill a dog; I am not prepared to dispute with him on this score.

We have killed 260 dogs on this outfit, and have inoculated and tagged 746. W. C. Howard, Superintendent, Sanitary Department, has direction of the pound and killing apparatus because of the fact that he operates the municipal incinerator, where the bodies of the dogs are burned.

This ordinance was adopted by the city, under the writer's suggestion and direction, on account of the prevailing rabies in other sections. Not a single case of rabies has been reported since we began enforcement.

W. AUSTIN SMITH,
City Manager.

Albany, Ga., August 19, 1924.



THE MERCIFUL EXECUTION OF UNCLAIMED DOGS

1. The detention house. 2. The collar by which the current is applied. 3. Before the current is turned on. 4. A few seconds later

Burning Oil Under Municipal Power-Plant Boilers

By W. F. Schaphorst, M. E.

OIL burning cannot cure all ills, hence municipal officials should not be over-enthusiastic in installing oil-burning equipment. Oil burners cannot improve a boiler. All a burner can do is to improve combustion and generate more heat in the furnace per dollar. After the heat is generated the duty of the boiler is to absorb as much of the heat as possible. If the boiler is covered with soot or filled with scale it is no fault of the burner, and it is not likely that the boiler will perform any better with oil for fuel than with coal.

It is not always easy to compare the cost of oil with the cost of coal, because of the many factors that must be considered. Thus, to arrive at the actual cost of oil "in the furnace," the following items usually enter: purchase price; freight and demurrage; trucking; unloading and pumping; storage, pumping to burner system; possible leakage or other losses; heating in burner system; maintenance; air or steam for combustion; interest and depreciation on the entire outlay; insurance and boiler-room labor. Similarly, when computing the cost of coal, all items involved in getting the coal "into the furnace" must be included.

An approximate rule, which is easy to remember, is "Divide the cost of coal in dollars per long ton (2,240 lbs.) by 2. If the result is greater than the cost of oil in cents per gallon it will pay to burn oil." This rule should not be depended upon entirely as there are many factors to be considered.

Recent quotations giving the maximum prices for fuel oils in the *Oil & Gas Journal* are:

Chicago District	$ .80	maximum	per	bbl.
Kansas District	.95	"	"	"
Oklahoma District	.75	"	"	"
North Texas District	.80	"	"	"
North Louisiana District	.85	"	"	"
Arkansas District	.03½	"	"	gal.
Gulf Coast District	.04½	"	"	"
Pennsylvania District	.05	"	"	"

There is not a great difference in heat values of fuel oils, the average value being 18,500 B.t.u.

Advantages of Oil Burning

Municipal officials and engineers are naturally interested in the relative advantages and disadvantages in using fuel oil under boilers. All sides should be carefully considered before making any drastic and expensive alterations in one's plant. The following list includes most of the advantages of oil burning:

1. Oil burning makes it possible to put boilers into operation more quickly than with coal.
2. Heat can be instantly shut off in case of tube rupture or other accident.
3. There is no banking of fires.
4. Boiler settings are more easily maintained because there is no vibration due to stokers, conveyors, doors, coal, shovels, slice bars, shaking grates, etc.
5. Furnace linings suffer no damage due to firing-tools, grate-bars, or clinkers.
6. Because of the uniform heat obtained from oil firing there is no damaging effect on crown-sheets and tubes as is the case when coal is used for fuel.
7. Better combustion is obtainable.
8. It is easier to control the air with oil firing by means of automatic damper regulation, resulting in more perfect combustion.
9. Oil fires never have to be "pulled."
10. No pulverizing is necessary, hence the cost of that labor and machinery is saved.
11. Oil does not diminish in heat value during storage.
12. Oil is not screened in order to "select lumps of the same size."
13. Less power is required to operate the mechanical draft.
14. Oil requires only about one-half the space occupied by coal of the same heat value. It is 25 per cent less in weight for equal heat value and possesses 35 per cent more heating value per pound.
15. Oil does not crumble or deteriorate in storage.
16. Oil does not ignite spontaneously.
17. Since oil does not pulverize or form dust there is no danger of dust explosions.
18. Because of more complete combustion there is seldom any smoke when the plant is properly operated.
19. Less heat is lost up the stack because less

air is required for complete combustion. The cleaner heating surface of the boiler is bound to absorb more heat than with coal.

20. Less steam is consumed for soot cleaning because tubes do not need to be cleaned as often.

21. Less labor is required for soot cleaning.

22. Smaller chimneys may be used because of the smaller amount of air used. In new construction this sometimes reduces the first cost appreciably.

23. When ashes and live coals drop through the grate they are hot and the heat in them is lost. There is no such loss with fuel oil because there is no ash or live coal.

24. For variable load conditions fuel oil is ideal. It enables boilers to take care of sudden changes in loads.

25. Because of the preference for oil burning by most engineers, a higher grade engineer is often obtainable for the same money.

26. Uniform steam pressure is more easily maintained throughout the day.

27. No ashes or soot are scattered over the surrounding neighborhood.

28. Increased boiler output with fuel oil may save the cost of an additional boiler. It is claimed by one burner manufacturer that boiler output is often increased as much as 50 per cent.

29. Two men can do the firing with oil burners which with coal would probably require nine men. A few pumps operated by a small number of men do away with a larger number of stokers, coal-passers, ash-handlers, etc.

30. Oil is seldom handled by hand. It is mechanically pumped into storage tanks located in out-of-the-way places. The fuel oil storage-tank may be located farther away from boilers than would be practical in the case of coal storage.

31. Greater cleanliness is possible in and about the plant and municipality because of the absence of coal and ash dust.

32. There are no ashes to be removed, consequently the cost of removal, storage, and the cost of equipment for handling ashes, are saved.

33. Oil is more easily controlled in combustion than is coal. It can be made to respond almost instantly to a peak-load demand.

34. Maximum boiler capacity is more easily maintained with oil. This permits extra steam to be used, if necessary, during long cold spells.

35. Oil-firing apparatus is maintained at less expense than coal-fired apparatus. There is practically no wear and tear on oil-firing equipment.

36. Higher boiler efficiency is possible with fuel oil.

37. With more time at his disposal, the engineer can give better attention to other details, thereby further increasing the general efficiency and safety of the plant.

38. No opening of furnace doors is necessary for firing or cleaning, consequently there is no sudden inrush of cold air and no temporary heat loss due to excess air.

39. Boilers are longer lived because of the elimination of strains caused by suddenly opened fire doors and the inrush of cold air.

40. The "human factor" is less prominent with oil burning after adjustments are once made.

41. Oil burners may be installed in almost any position—horizontal, vertical or oblique.

The Disadvantages of Oil Burning

The preceding list possesses, of course, only the favorable side of oil burning. The following list of disadvantages has been prepared and, although less impressive as to length, should be given equally careful study:

1. There are many unreasonable laws in some cities governing the storage of oil. This often makes its storage more expensive than the storage of coal.

2. Oil cannot be "dumped upon the ground" as can coal. Oil will "leak," whereas coal will not. The first cost of oil storage-tanks is therefore generally greater than the first cost of coal bins.

3. Tank wagons and cars are necessary for hauling oil while coal can be hauled in almost any vehicle.

4. Long-time oil contracts are not so readily obtainable as are long-time coal contracts.

5. Heaters are not necessary for feeding coal.

6. Less power is required for feeding coal.

7. Coal does not evaporate.

8. Coal combustion is less noisy than steam-jet oil combustion.

Types of Burners

When considering the changing over to oil burning and selecting a burner, it will pay to consider all details carefully. There are vast differences in burners. A type that will give excellent service in one furnace will not do well in another unless the conditions are right. Burners are to be had to take care of different grades of oil, such as Mexican crude, tar or fuel oils.

There are two broad classes of burners, (1) steam- or air-jet and (2) mechanical atomizers.

If the burner creates a long, high-velocity spray, the furnace must be long enough so that all oil will be completely burned before reaching the end of the furnace. If the burner creates a wide spray, the furnace must be wide. If the spray is conical, lateral dimensions must be sufficient to accommodate it.

With these points in view it is evident that one cannot always make the furnace fit the flame, particularly in old installations that were once coal-fired. Consequently, in such cases burners that will fit the furnace must be selected.

Some prospective users of oil burners are under the erroneous impression that only a "burner" is necessary—that it is hooked up with a steam pipe and that practically nothing else is required. However, in addition to the atomizer one must install an oil storage-tank of ample capacity, oil strainers, fuel oil pumps and governors, heaters, piping and fittings for both oil and steam, pressure gages, thermometers, steam traps, control valves, relief valves

and reducing valves. Pumps and strainers are generally installed in duplicate to insure continuous operation.

The steam-jet burner breaks up the oil into a fine vapor by the direct action of steam. Usually a thin, long, fan-shaped spray is produced and is forced to pass over the brick floor of the furnace while burning. The thinner the spray, the better. The brick in the floor, called "checkerwork," is laid with openings between so that sufficient air can enter to support combustion.

Among the advantages claimed for the steam-jet type as compared with the mechanical spray are:

1. The spray is produced more easily than with the mechanical type.
2. Oil pressure and temperature may both be lower.
3. The steam-jet type is simpler and less expensive.
4. It is more flexible.
5. The steam-jet burner creates a better draft than the mechanical type and requires less mechanical draft assistance.

On the other hand, there are some important objections to steam-jet burners that should be known before selecting that type:

1. Steam used cannot be recovered.
2. The volume of steam is necessarily added to the volume of the air. Provision must sometimes be made to take care of this additional volume.
3. Steam will condense on cool surfaces and cause the adherence of soot. The soot may then cake in hard layers on economizer surfaces and inside of the stack and may be removed only with great difficulty.
4. Sulphur compounds being commonly present in fuel oil may unite with the steam and form sulphuric or sulphurous acids, which attack and corrode the boiler, steel stack, or other metallic surfaces. Sometimes oil contains as much as 4 per cent sulphur.
5. The action of the steam upon the furnace walls sometimes causes spalling.
6. The steam-jet type is more noisy than the mechanical type.

Steam-jet burners are now used under all kinds and capacities of municipal power-plant boilers—water tube, horizontal return tubular, Scotch marine, and vertical types. Pressures used for forcing the oil through the burners vary all the way from 5 to 110 pounds per square inch, while the atomizing pressures, whether with steam or air, vary from 2 to 110 pounds per square inch. The oil pressure should never exceed the atomizing pressure. The atomizing pressure should be about 5 pounds greater than the oil pressure.

Superheated steam gives better results for atomizing than saturated steam.

The evaporation of 6 pounds of water per square foot of heating surface is considered safe practice with steam atomizers.

One manufacturer of oil burners states that with the use of some burners the consumption of steam runs as high as 7 per cent. A burner should not use more than one per cent of the steam generated. These figures are at variance with other authorities who place the minimum at 1.3 per cent and the maximum at 10 per cent.

If desired, air may be used in place of steam as the atomizing agent, and it would seem on first thought that air should give better results because where steam is used air also is required for combustion. It has been found, however, in actual practice, that atomization with steam gives better results than air. To furnish air for atomizing requires the use of an air-compressor which usually costs more than the first cost of the burners.

Where water is scarce, or where it is preferable to save as much steam as possible, the mechanical type of oil burner is used, or air is used instead of steam.

Mechanical Type Burners

Most mechanical burners are similar in principle, in that the oil is given a whirling motion at the burner tip so that the oil spray enters the furnace in the form of a hollow cone. Centrifugal force is depended upon to spray the oil, which mixes with the air after leaving the burner tip.

Theoretically the mechanical burner should be more efficient than either the steam-jet or air-jet burner. In practice, however, the average mechanical burner gives more trouble. Besides, some of them use as much steam for their operation as do those of the steam type.

The conical spray has an important advantage over the flat steam-jet spray in that its area is greater. Consequently the furnace need not be as long. Further, the air supply passes through a register surrounding the burner and can be regulated more accurately than air flowing through brick checkerwork.

Mechanical burners are sometimes arranged in tiers, which is less practical with the steam-jet type. The mechanical burner causes less furnace loss because of the absence of steam that is always lost up the stack with the steam-jet type. Mechanical burners are quiet in operation as there is no "blowing" and they give higher efficiencies at high boiler capacities.

The mechanical system is often called the "high-pressure system." This is not a good name because, according to one prominent

manufacturer, "75 per cent of the mechanical oil-burning systems installed by this company are operating on oil pressures of less than 100 pounds per square inch." In general the pressure ranges all the way from 30 to 200 pounds per square inch.

The disadvantage of this burner is that if the stack is not high it generally requires forced draft, unless the load is low. A combination of natural and forced draft is often used with the mechanical burner.

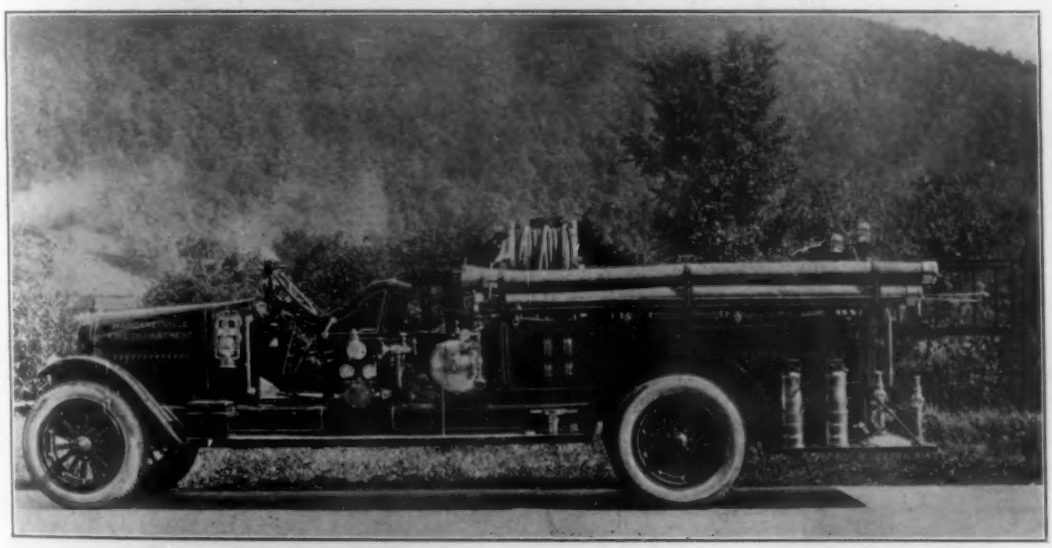
Oil Preheated

Good engineering practice with mechanical burners requires the combustion of 2 pounds of oil per hour per cubic foot of furnace volume. Oil must be preheated before it can be successfully fed into the furnace by either type of burner. It is generally heated in proportion to its gravity. The heavier the oil, the higher the temperature required. Oil up to 20 degrees Baume should be heated to 15 or 20 degrees below flash-point to insure free flowing. Oils over 20 degrees Baume need be heated only sufficiently to ensure their flow.

Unless the oil is hot enough the burner will smoke, giving incomplete combustion. If, on the other hand, the oil is heated too hot, the burner will lose in heating capacity because of the increased volume of the hotter oil passing through the burner. When the weight of oil passing through the burner per minute is reduced, it is obvious that less heat will be produced in the furnace. Oil should never be heated above its flash-point before it reaches the burner. Preheating causes carbonization and clogging of the piping system and burners.

The following instructions from the United States Navy Instructions on the operation of fuel oil burners will be of considerable value to the practical engineer.

"In operating oil fuel a study of the appearance of the furnace is a good guide to furnace efficiency. If the flame is an incandescent white and the furnace walls are clearly discernible through it, there is considerable excess air present. As the percentage of excess air is reduced, the color of the flame at the rear of the furnace becomes a pale yellow, then yellowish orange, and orange red. In general, with a well-designed installation in good condition, operating with the minimum of excess air, the end of the flame farthest from the atomizers is a yellowish orange or golden shade. The gases of combustion are colorless and the seams in the brickwork are just discernible."



THE NEW TRIPLE-COMBINATION OF ENGINE COMPANY NO. 1, MARGARETVILLE, N. Y.

We are informed by R. W. Marks, Fire Chief, Margaretville, N. Y., to whom we are indebted for this photograph, that this piece of equipment is not complicated and is easy to handle, has a quick "get-away" and ample speed and power for all requirements. The chassis is a Larrabee-Deyo with a 160-inch wheel-base. The Childs triple-combination equipment includes a 40-gallon copper chemical tank with 200 feet of chemical hose mounted on a reel, two acid and two soda receptacles mounted on a running-board, one 500-gallon Northern pump with four lengths of suction hose, two Utica short cut-off play pipes, 1200 feet of standard fire-hose, one 12-foot roof ladder, one 24-foot and one 36-foot extension ladder and four Siamese connections. In addition, the truck carries the usual equipment of axes, torches, search-lights, door-openers, etc. The pump is guaranteed to handle 500 gallons of water per minute from a draft not exceeding 24 feet vertical lift. It passed a 12-hour endurance test under the direction of the National Board of Fire Underwriters and discharged in a 6-hour test an average of 562 gallons per minute at a pressure of 129 pounds through two 50-foot lines to 1-inch and 7/8-inch nozzles

Chamber of Commerce Activities in Public Affairs

Trolley and Bus in Saginaw

SAGINAW, MICH.—The article by Walter Jackson on "Trolley or Bus in the Small City?" in the September number of THE AMERICAN CITY, indicates a wide-spread interest in a problem which we believe has been successfully solved in Saginaw.

On August 11, 1921, the Saginaw-Bay City Railway Company ceased operation following the refusal of Saginaw's electors to grant a new franchise which included the ride-at-cost plan. Jitneys and busses of sundry types attempted to give local service, while the Commission endeavored to find a responsible organization to inaugurate a dependable bus system.

On January 19, 1922, reports were presented at a membership meeting of the Board of Commerce by two committees that had been studying the problem, one as to the efficiency of the motor coach, and the other as to a comprehensive transportation plan that would prove attractive to an operating company. Both of these committees recommended the reestablishment of street cars in the congested districts, with bus lines as feeders covering three routes through portions of the city not served by the street cars.

At this meeting a resolution was approved requesting the Board of Directors to submit these reports to the membership with a referendum covering (1) the committees' recommendation, (2) a system of busses exclusively, and (3) a municipal ownership proposition then advocated by one of the city commissioners. The result of this referendum was 510 votes for the committee proposal, 197 for busses, 1 for municipal ownership, and 1 against everything.

Upon this report the Board of Directors fixed the policy of the Board of Commerce and appointed a committee to draft a franchise after a conference with the bondholders and the receiver. When this franchise was submitted to the electors, it received the necessary 60 per cent majority, but through the carelessness of an election inspector using a rubber stamp in initialing ballots, more than 500 favorable ballots were declared void by the Court, and the franchise lost by 72 votes.

On January 10, 1923, the Directors of the Board of Commerce invited the heads of eighteen other local organizations to a conference to discuss the situation and re-submit the franchise. At this conference the Transportation Committee of the Board was authorized to confer with the trustee in bankruptcy to secure agreement on certain changes in the proposed franchise to meet objections made during the previous campaign. These changes having been accepted, the Board of Directors took steps on January 23 to have the revised franchise submitted to a vote on April 2.

On this same day the Council voted to submit a ten-year motor-bus franchise to the electors on March 7. This franchise was opposed by the Board of Commerce and it was overwhelmingly defeated, the vote being 6,083 for, to 8,540 against.

On April 2 the car-bus franchise received a majority of 3,197 votes, but lacked 142 votes of getting the required three-fifths vote. However, at this election the Mayor and two commissioners who had been unfavorable to the reestablishment

TYPE OF BUS USED AS FEEDERS FOR THE STREET-CAR SERVICE IN SAGINAW

of cars were defeated and a commission favorable thereto elected. Under the leadership of the new commission, the franchise was again submitted, on June 25, and approved by the overwhelming vote of 9,112 to 3,061.

Formal organization of the new company was immediately started, nine directors being chosen, six to represent the public and three the security holders. All the directors serve for fifteen years. The six representing the public are approved by the Mayor and the Circuit Judges of Saginaw County.

The new company began operations on its fifteen-year franchise on November 1, 1923. The fare is fixed for the term of the franchise at ten cents cash, four tickets for twenty-five cents, and free transfers interchangeable between all cars and busses.

Public sentiment is enthusiastic for the efficiency of Saginaw's present transportation system.

CHARLES W. HAENSEL,
Secretary, Saginaw Board of Commerce.

FIRST INDIAN SECTION OF THE PARADE IN THE PEKIN, ILL., CENTENNIAL CELEBRATION
Giving an idea of the size of the crowds that lined both sides of the streets for a mile and a half

A Three-Day Centennial Celebration

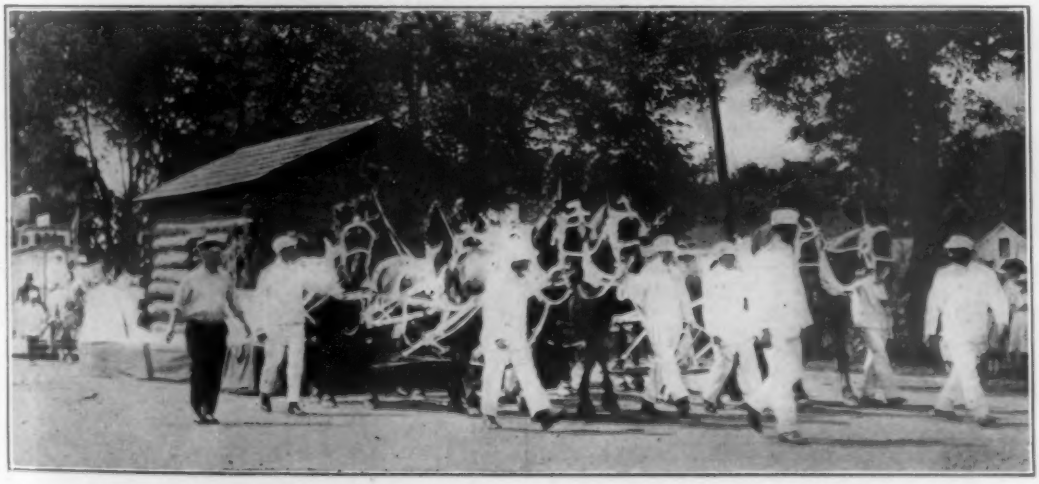
PEKIN, ILL.—On July 2, 3 and 4 this Central Illinois city of 14,000 population celebrated the 100th anniversary of the building of the first log cabin by one Jonathan Tharp on the present site of the city.

In order to commemorate this earliest beginning of the municipality, it was decided to invite all former residents, friends, relatives and guests to a big birthday party. The plans were started about ten months before the date finally chosen for holding the celebration.

From the first inception of the Centennial, the sentiment of the business men was that, for once in the history of Pekin, a celebration with its accompanying crowds should be staged without the ulterior motive of exploitation for profit. No games of chance were allowed and no charges made for any of the entertainment. Everything was free.

The whole three-day program cost about $8,000, which money was raised entirely by popular subscription. Two plans of finance were used. One was a house-to-house canvass, by captains and workers, for the sale of Pekin Centennial Patron Buttons. Any one giving $1 or more to the general fund was considered as a Patron of the celebration, and therefore entitled to wear the button. On this drive, practically every home in the city subscribed. The rest of the money was raised in the business district and from the industries. The subscriptions from these latter were based on the length of time they or their firm had been established in the city.

In planning for the Centennial, invitations were first sent to all organizations in the city, asking



A REPLICA OF THE FIRST LOG CABIN IN PEKIN, ILL., USED IN THE CENTENNIAL CELEBRATION
The cabin is made of ash logs, and its estimated weight is 20,000 pounds. It has been placed on a permanent foundation in a city park

each to appoint a Centennial Committee of three. These committees were then called together to a general mass meeting, at which time the organization was built up that eventually carried the plans through to successful completion. An executive committee was created, made up of one representative from every interested organization in the city, and every phase of the program was covered by an active special committee. Probably the biggest factor contributing to the success of this civic event was this committee service. Two hundred and thirty people were involved in some way in preparing for and administering the affairs of this undertaking.

The forms of publicity used were newspaper advertising, poster service throughout the county, engraved invitations sent to a special mailing list of influential men and women, and an embossed seal, or sticker. The engraved invitations were sent to the leaders of government at Washington and at the State Capitol, as well as to the mayors, public officials, and newspaper men of nearby cities. The embossed seals, 25,000 of them, stimulated letter writing. They were distributed free of charge to any one for the asking, the only requirement being that they be used only on outgoing mail.

One of the "high lights" of the Centennial was the Old Relics Exhibit, for which every show window of any consequence in the city was used. All articles of historical interest and of any antiquity, obtainable in the community, were on display. In order to make this more interesting, certain windows had related objects, such as complete bedroom furnishings, dining-room sets, kitchen equipment, books, linens, arms—both Indian and pioneer—pictures, newspapers, etc. This exhibit proved to be so interesting that people continued to come from neighboring cities to see it days after the period of celebration had passed.

Each day, a program of stunts and contests of various kinds was held, the winners receiving valuable prizes of Pekin-made products.

The first day was Home-Coming Day, the program including contests, band concerts, a county picnic and a ball game. An official register was opened in the Court House for the registration of all visitors and former residents. During the three days some 2,000 visitors registered.

On the first evening, a play entitled "One Thousand Years Ago" was staged in the natural amphitheater in the City Park. The setting of this play was in Peking, China. One hundred people took part. The performance was seen by over 8,000 people.

On the second day, in addition to the program of stunts and races and the exhibition of antiques, a free barbecue was featured. It was estimated that 7,600 people were fed. A feature of the afternoon program was the Indian dances and pantomime, put on at the Indian village established in the park. In the evening a costume and mask dance was held, which proved to be very popular. Cash prizes were given for the most unique costumes, special emphasis being given to those showing styles prevailing 100 years ago.

The last day of the celebration, the Fourth of July, was notable for the great number of people who came to see the historical pageant parade, to hear noteworthy speakers, and to see the ball game and the big display of fireworks in the evening. The first section of the parade was historical and contained 26 floats. The second section was fraternal. In all, it stretched over 2 miles.

The estimated number of visitors in the city on the Fourth of July was 60,000. An accurate check on cars coming into the city over the main traveled highways showed that there were in excess of 11,000 cars in town.

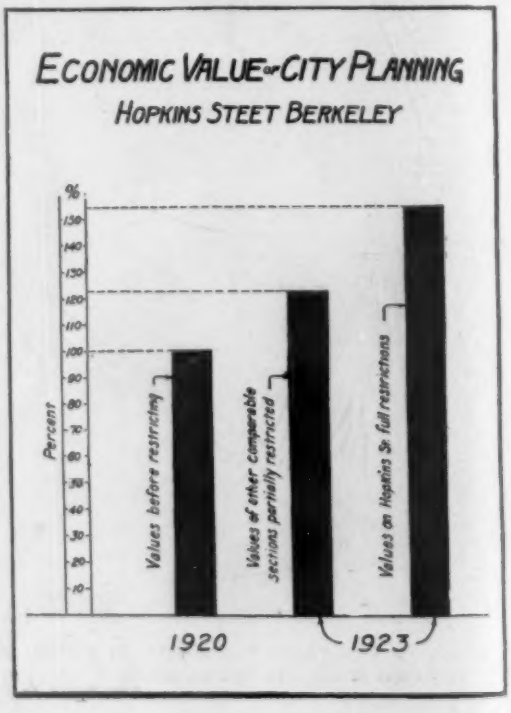
Taking it all together, and considering it as a civic enterprise, Pekin's Centennial was a pronounced success. More people joined forces to make it a success than have ever before been joined together in any civic enterprise in this city. It promoted civic pride and a willingness to serve.

L. D'OOGE,
Secretary-Manager, Association of Commerce.

Land Values Increased by Restrictions

BERKELEY, CALIF.—At a Fair recently held by the Chamber of Commerce, the municipal booth contained many interesting graphic charts that described many functions of the city government. Among these were two charts that showed the economic value of parks and residence building restrictions. The former showed that the value of the property in the vicinity of Central Park, New York, in 1858, had increased 800 per cent in fifteen years owing to the opening of Central Park. Similar comparable property values somewhat remote from the Park increased but 100 per cent.

The other chart showed the effect of building restrictions in Berkeley as evidenced by the increased assessed valuation of the property along and near Hopkins Street between the Southern Pacific tunnel at the end of Del Norte and the Alameda. These relative values are shown in the graph below. The height of the columns in the graph were computed in percentages by taking the values of property along Hopkins Street and also near Hopkins Street and in the vicinity of Carlotta and Posen Streets. These values are taken at 100 per cent in 1920. In three years the fully re-



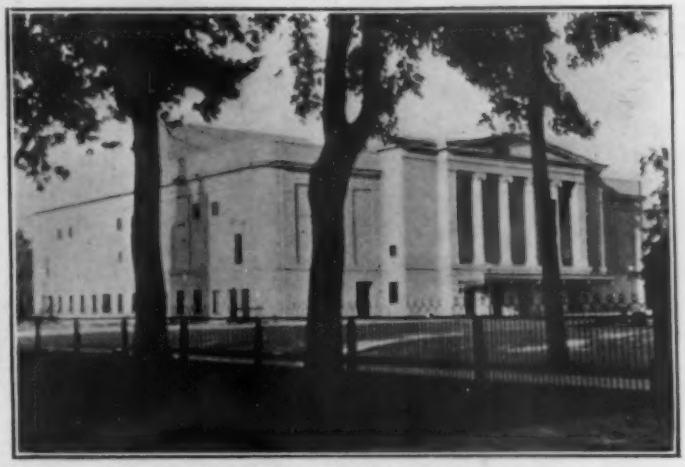
stricted residence property along Hopkins Street between Del Norte and The Alameda increased in value about 54 per cent, while the less restricted property west of The Alameda increased about 23 per cent.

The City Planning Commission is using such facts as these to prove to the people of Berkeley that, in residence districts generally, the growth of assessable valuation is retarded if uncertainty exists regarding the determination and stability of restrictions. The predominance of the residence character of Berkeley makes it imperative, for economic considerations, to strive to increase its property values by suitable zoning, stability of restrictions, enhancement of beauty of structure, setting and arrangement, by up-keep of streets, parked areas, and wise provision for growth.

WESLEY C. MILLER, JR.,
Secretary, City Planning Commission.

Municipal Auditorium Serves Local Needs and Attracts National Conventions

COLORADO SPRINGS, COLO.—Since the formal opening of the Municipal Auditorium in June, 1923, the building has been in big demand. Famous opera singers, pageants, fairs, basket-ball games, state and national conventions of political and fraternal orders, boxing contests, great religious gatherings, balls, agricultural exhibits and band concerts have been held in the structure. The building includes three so-called little theaters, which are constantly in demand for various affairs. In the basement the Police Department of Colorado Springs has a large rifle and pistol range.



MUNICIPAL AUDITORIUM, COLORADO SPRINGS

INTERIOR OF THE COLORADO SPRINGS AUDITORIUM

The building was financed by a bond issue voted by the taxpayers of Colorado Springs in June, 1921, the electors authorizing an issue of $390,000. This did not include the furnishing of the structure, which brought the total cost up to $424,000. Maintenance is comparatively inexpensive, the City Manager's report for 1923 showing the total cost to be $4,885, from which must be deducted the rentals.

The Chamber of Commerce of Colorado Springs —with an active membership of 1,073—indorsed the project and aided in putting the bond issue over. Completion of the building, which seats slightly more than 3,000 persons, makes it possible to invite national conventions to the Pike's Peak region—a physical impossibility hitherto.

ELIZABETH L. BELSCHNER,
Secretary, Convention Bureau, Colorado Springs Chamber of Commerce.

To Create a Chain of Four Islands

NEW ORLEANS, LA.—Following the authorization by the Louisiana Legislature of the issuance of bonds for the development and beautification of the New Orleans shore-line of Lake Pontchartrain, and the creation thereby of an all-year water-side resort, the New Orleans Association of Commerce has submitted plans for such a project to the Levee Board.

Lake Pontchartrain, which is an arm of the Gulf of Mexico forty miles in length and twenty miles in width, is for the most part shallow, its depth in some places being only ten feet. The Association has therefore suggested that the Levee Board take advantage of this feature by the creation of a chain of four islands, as illustrated on the drawing reproduced on page 380. These islands, which would contain more than 1,000 acres of land, would afford excellent locations for resort hotels, tea gardens, recreation parks, bathing-beaches, etc. In addition, they would provide a much-needed protected harbor three-quarters of a mile wide and five miles in length. While no estimate of cost and probable revenues was submitted with the plans, the Association has satisfied itself, through consultation with archi-

tects, engineers and dredging contractors, that the cost of building up the proposed islands would not exceed the value of the land so provided. It has been estimated that the creation of the land would cost about $7,000 an acre, and by making one-half of this land available for sale at its probable value of about $40,000 an acre, sufficient funds would be received to cover the entire cost of the project, including the embellishment of the parks, construction of driveways, etc.

The Association's plans also include the extension of the present shore-line and the reclamation of several thousand acres of land for public parks, playgrounds, boulevards and residential sites, and the construction of a land and hydroplane base, the need for which has been impressed upon the city of New Orleans many times in recent years. The cost of these developments also, it is believed, will be more than covered by the revenue from the sale of surplus improved water-front sites.

WALTER PARKER,
General Manager, New Orleans Association of Commerce.

Organizing a County for Municipal and Regional Planning

IN the formation of the Passaic County Planning Association, with headquarters for the present in the Chamber of Commerce, Paterson, N. J., a unique method has been adopted for the organizing of residents of a county in a group whose purpose is the advancement of the city and county planning movement.

Bertram H. Saunders was the prime mover of the organization. He is the Chairman of the North Jersey Rapid Transit Commission, empowered by the New Jersey Legislature to deal with passenger facilities in the metropolitan district of New Jersey adjoining New York City, and also a member of the City Plan Commission and the Zoning Board of Adjustment of Paterson.

The organization of the Passaic County Planning Association has followed a carefully outlined course designed to insure its permanency. Early this year there was called together a group of prominent and influential men of Paterson and Passaic County at a dinner round-table in the Hamilton Club, Paterson, at which the sentiment that was sounded was in favor of the formation of such an association. This was followed by a public mass meeting in the High School auditorium, Paterson, at which Lawson Purdy, of the Plan of New York and Its Environs, and Thomas Adams, general director of plans and surveys of that committee, were speakers. At this time the approval of 500 citizens was given to the formation of the association and a committee was appointed to carry out the organization.

A series of organization meetings followed; the Passaic County Planning Association was incorporated under the laws of the state; temporary officers were named, then a constitution and by-laws drawn, and later permanent officers elected. At one of these organization meetings, an illustrated talk was given by Major Gilmore D. Clark, landscape architect of the Westchester County Park Commission, showing the development of the Bronx River from what was actually an open sewer to a beautiful parkway, thirteen miles long and running from New York City to the Kensico dam, on which the sum of $15,000,000 has been expended.

The Passaic County Planning Association takes on what is believed to be its unique form in that its membership is to include as many groups as there are municipalities in the county. Permanent organization was effected in June, so that with the ensuing summer vacation period the building up of a large membership was deferred until after Labor Day, but officers have been elected and group chairmen appointed as follows:

President, Richard Morrell, Passaic; First Vice-President, John C. Barbour, Clifton; Second Vice-President, Frederick S. Ranzenhofer, Passaic; Third Vice-President, Bertram H. Saunders, Paterson; Secretary, Filbert L. Rosenstein, Paterson; Treasurer, William R. Meakle, Paterson; Paterson group chairman, Mr. Saunders; Passaic group chairman, Mr. Ranzenhofer; Clifton group chairman, Mr. Barbour; and Hawthorne group chairman, William Mearns. There are three cities and thirteen boroughs and townships in Passaic County.

The object of the Passaic County Planning Association, as stated in the by-laws, is "to disseminate information relative to municipal and regional planning and to promote interest in the orderly development of our region." As much of the work will be in the nature of educational propaganda, the Association has named an active newspaper man, Charles A. Winans, as its executive secretary on a part-time basis. Membership is open to any adult resident of Passaic County upon payment of $1 a year dues in advance.

A Study of the Source and Expenditure of County Highway Funds

Results of an Analysis of the Finances of Four Wisconsin Counties, by the Committee on Highway Finance of the Advisory Board on Highway Research of the National Research Council

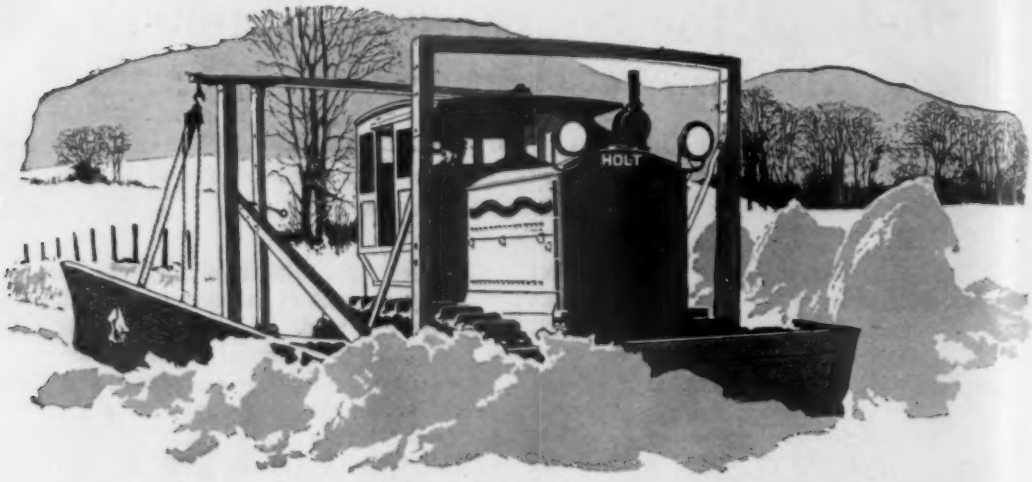
DR. J. G. McKAY, of the United States Bureau of Public Roads and Chairman of the Committee on Highway Finance, in the report of that Committee at the third annual meeting of the National Research Council, Division of Engineering, stated that before any decision could be made as to the justice or expediency of present methods of highway financing, it was necessary to make a complete study of the sources of highway revenue, local, county and state, in typical states. Most of the previous investigations have been limited to a study of the sources of state revenue for highway purposes and have disregarded the county and local expenditures for highway construction and maintenance. The following results are based on an analysis of all sources of revenue and expenditures in four Wisconsin counties from 1915 to 1921. Wisconsin was selected as a state whose system of highway financing represents a fair average of methods of raising highway revenues in other states. The four counties—Dane, Outagamie, Rusk and Waukesha—were chosen for the purpose of determining the percentage of revenue for highway purposes which is provided by each of the several sources of revenue. These counties were selected as typical counties, representing the highway development in different sections of the state.

Dane County is a well-populated, rich agricultural county, with no highway bond issues. Madison, the capital city of the state, is located in the center of this county. Outagamie County is a good agricultural county. It has financed a large portion of the construction of its highway system through bond issues since 1916. Rusk County is located in the newer section of the state. It is a purely agricultural county, with soil of average fertility, but as yet largely undeveloped. No highway bond issues have been made and its highways are, with the exception of the state trunk highways, largely unimproved. Waukesha County lies west of the city of Milwaukee and is a rich dairying and manufacturing county. It has floated large bond issues during the last three years.

To determine the total expenditures for highways in each of the counties in which the analysis was made, it was necessary to consolidate the expenditures made by the local units within the county, the expenditures made by the county, and the expenditures of state and federal funds within the county. The expenditures by the different governmental units have been carefully analyzed and all expenditures appearing in the records of more than one unit have been eliminated in all except the unit which actually raised the funds for highway construction or maintenance. In the local units the expenditures made by cities have been eliminated, as their expenditures are almost exclusively for streets rather than for highways.

An analysis of the total expenditures for highways within each county shows that the proportion of the burden of all highway expenditures which rests upon real property varies from 55 per cent to 70 per cent in the four counties. The highest proportion is found in Rusk County, a relatively undeveloped county, while the lowest proportion is found in Waukesha County, a very rich section, both agriculturally and industrially. This variation is due largely to differences in revenue derived from the income tax. In the richer counties the income tax furnishes a larger portion of the total revenue, and, as a result, in so far as funds for highway expenditures are taken from general revenues, the income tax furnishes a larger proportion of revenue for highway expenditures. It must be noticed that real property taxation and "other revenue" taken together furnish almost the same proportion of revenue for highway expenditures in all counties, the figures being: Dane County, 76.82 per cent; Outagamie County, 79.86 per cent; Rusk County, 81.35 per cent; and Waukesha County, 78.68 per cent.

A comparison of the proportions furnished by each source of revenue in any one county for the different years substantiates the conclusion that the contribution of real property varies inversely as the contribution of "other revenue." "Other revenue," as the name in-



The Nation's Road Maker

HOLT TRACK PIN

The Holt track pin illustrates the rigid requirements of Holt quality; and it is an important factor in "Caterpillar" strength and endurance. Cold drawn 3½ per cent nickel steel, used in 5-Ton and 10-Ton track pins, has an initial tensile strength of 65,000 lbs., Scleroscope hardness 25 to 30. This stock is subjected to three heat treating operations. (1) Case hardening; to withstand abrasion. (2) Hardening; toughening the core; increasing hardness of case. (3) Drawing; refines metal structure. The track pin emerges from the Holt heat treatment with a tensile strength of 140,000 lbs. Scleroscope hardness of core 40 to 45, hardness of case 75 to 85; doubling initial tensile strength, tripling initial hardness.

Wherever you see "Caterpillars" at work, building or maintaining roads, or on engineering projects of all kinds, you may know that a wise investment has been made for the *right* power equipment. The "Caterpillar" is a real servant; it has rugged endurance; ample power.

With its sturdiness and positive traction, the "Caterpillar" stands the hardest usage; pulling heavy graders, scarifiers, scrapers, maintainers, and every other type of road tool, in the toughest soils; hauling great tonnages of materials and supplies; moving dirt on all kinds of engineering projects; breaking snow blockades on northern city streets and country highways. It is built to work—and built to last.

No other machine has such varied usefulness. Most of your tractive jobs can be done better, quicker and cheaper with the "Caterpillar" than by any other method. Cities large and small, counties, townships, road districts, park boards, contractors, prefer "Caterpillars" because no other power is so economical; no other is so versatile in getting work done at the least cost and in the shortest time.

Our new booklet will interest you. Copy will be sent upon request.

"THE NATION'S ROAD MAKER"

There is but one "Caterpillar"—Holt builds it.

THE HOLT MANUFACTURING CO., Inc.

PEORIA, ILLINOIS STOCKTON, CALIF.

***Eastern Division:* 250 W. 54th Street, New York**

CATERPILLAR
Reg. U.S. Pat. Off.

dicates, is made up of all sources of revenue exclusive of real property, personal property, automobile license fees, special assessments and miscellaneous contributions, but the principal part of it is made up of revenue derived from the income tax. The other sources of revenue included under this head, such as fees, fines, etc., form a very small proportion of the total in this class. The annual expenditures by counties from each source of revenue show that in the years 1917 to 1918, when the receipts from the income tax were highest, the proportions of revenue derived from real property taxation were smaller than in the years when the receipts from the income tax were smaller:

PERCENTAGE OF TOTAL REVENUES FOR HIGHWAY EXPENDITURES RAISED BY VARIOUS GOVERNMENTAL UNITS

County	Local Funds	County Funds	State Funds	Federal Funds
Dane	41.27	32.81	20.54	5.38
Outagamie	34.88	49.63	12.01	3.48
Rusk	48.20	30.37	15.36	6.07
Waukesha	39.56	29.55	21.76	9.13
Average	39.62	36.43	17.80	5.76

This table indicates the importance of funds raised by the local units (townships and villages) for highway purposes, as compared with state and federal funds. It will be noted that the funds raised by the local units and counties furnish from 69 per cent to 84 per cent of the total highway expenditures. While this analysis is based on only four counties, it is safe to assume that these proportions are reasonably correct for the state of Wisconsin, since the counties studied were selected as representative of the various counties within the state. In other states the proportions raised by the various governmental units may vary to a considerable extent from those shown in the table, but in those states organized on the township basis the funds raised by the local units and counties will approximate these percentages. The percentages shown are derived from total expenditures within the different counties for the period 1915 to 1921, inclusive. It should be noted that this period includes a few years before the period of federal aid, and also that the activity of the state in the highway field has increased greatly during the later years; so that had the period been made to include only the years 1918 to 1921, the percentages derived from state and federal funds would probably have been larger.

Although the proportions of highway expenditures contributed by local, county, state and federal units, as indicated above, may vary to a considerable extent in different localities, nevertheless the figures are conclusive evidence that any discussion of highway finance treating exclusively of state and federal expenditures omits local and county expenditures, which constitute the major portion of the total highway expenditures. While it would be advantageous to have more of our highways entirely financed and constructed by the state, the fact remains that at the present time local and county highway expenditures absorb the major portion of funds raised from all sources for highway improvement.

PERCENTAGE OF TOTAL REVENUE FOR HIGHWAY EXPENDITURES FROM REAL PROPERTY TAXATION LEVIED BY THE VARIOUS GOVERNMENTAL UNITS

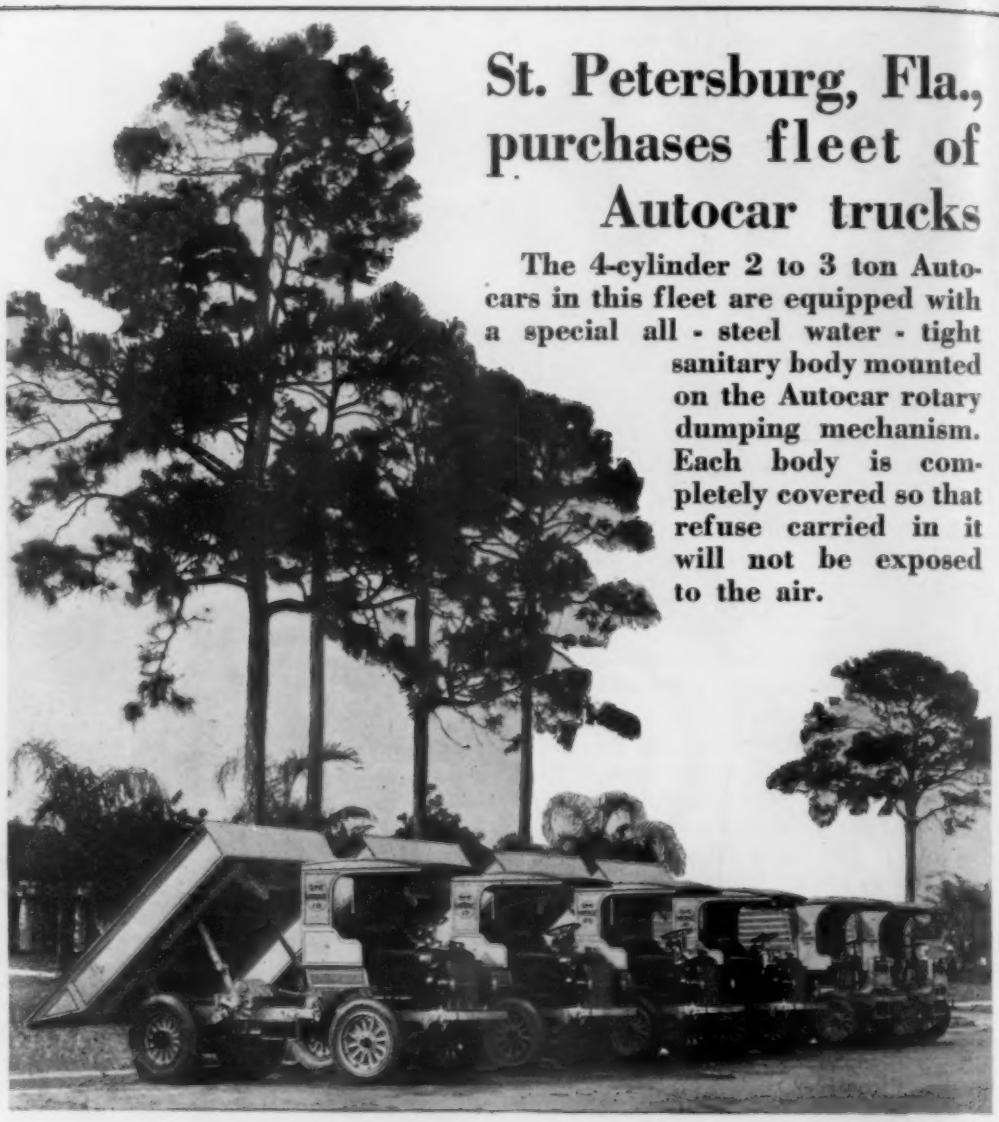
County	Local Taxation	County Taxation	State Taxation	Federal Government	Total
Dane	30.56	21.98	7.75	....	60.29
Outagamie	23.32	35.04	4.41	....	63.27
Rusk	39.54	24.81	5.48	....	69.83
Waukesha	25.39	21.54	8.36	....	55.29
Average	28.42	25.94	6.71	....	61.07

While the general property tax is the most important single source of revenue for highway expenditures in all units—the township, the county and the state—its importance as a source of highway revenue is much greater in the township and county than in the state. As will be noted in the table giving the percentage of total revenue for highway expenditures from real property taxation levied by the various governmental units, real property taxation by the local units furnishes from 23 per cent to 39 per cent of all highway expenditures, and county real property taxation provides from 21 per cent to 35 per cent of the total highway expenditures, while state real property taxation provides only from 4 to 8 per cent of the total highway expenditures.

PERCENTAGE OF REAL PROPERTY REVENUE FOR HIGHWAY EXPENDITURES LEVIED BY THE VARIOUS GOVERNMENTAL UNITS

County	Local	County	State
Dane	50.70	36.45	12.85
Outagamie	36.70	56.33	6.97
Rusk	56.62	35.52	7.86
Waukesha	45.93	38.95	15.12
Average	46.54	42.47	10.99

The table showing the proportion of real property taxation revenues for highway expenditures levied by the various governmental units shows an average of 46.54 per cent revenue raised by local units, 42.47 per cent by county units, and 10.99 per cent by the state. The real property revenue for highway expenditures raised by the state in comparison with local and county real property revenues is but a small share of the total real property revenue raised for highway improvement.



St. Petersburg, Fla., purchases fleet of Autocar trucks

The 4-cylinder 2 to 3 ton Autocars in this fleet are equipped with a special all - steel water - tight sanitary body mounted on the Autocar rotary dumping mechanism. Each body is completely covered so that refuse carried in it will not be exposed to the air.

These Autocar trucks are being used by the St. Petersburg Department of Public Works for garbage removal, general sanitation work and especially in connection with the city's campaign to exterminate mosquitoes.

Send with your Letterhead

THE AUTOCAR COMPANY
Box 2001, Ardmore, Pa.

Without obligation, please send me more information regarding economies resulting from combined use of gas and electric trucks.

The Autocar Company
ESTABLISHED 1897
Ardmore, Pa.

Branches in 46 Cities

Autocar
gas *and* electric trucks
EITHER OR BOTH - AS YOUR WORK REQUIRES

SOURCES OF HIGHWAY REVENUE FOR TOTAL HIGHWAY EXPENDITURES

Source	Average Percentage
Real property taxation	62.17
Other revenue (largely income tax funds)	17.01
Personal property taxation	11.29
Vehicle license fees	8.84
Miscellaneous	.69

It is to be noted that real property taxation produces seven times as much of the total highway revenue as that derived from motor vehicle license fees, while the taxation of incomes, that is, other revenue, produces approximately double the amount raised by vehicle license fees. Since local funds are expended on purely local roads, it is fair to compare the amount of county and state real property tax funds produced for expenditures on state and county highways with the amount raised by vehicle license fees used on the same highways. County and state real property taxation produce 32.65 per cent of total highway revenue, license fees produced 8.84 per cent. Real property, which contributes 61 per cent of all highway expenditures, produces for county and state highways four times as much of the total expenditures as that produced from vehicle license fees.

Conclusion

The following conclusions are based on the analysis of the sources and expenditure of highway funds in the four representative Wisconsin counties chosen for this study:

1. The major portion of the total of highway funds in Wisconsin during the 7-year period from 1915-1921 was raised by township and county units rather than by the state.
2. Real property taxation was the chief source of highway revenue, producing an average of 61.07 per cent of the total local, county and state highway expenditures.
3. Vehicle license fees produce 8.84 per cent of the total highway expenditures.
4. Real property taxation for highway purposes bears too large a portion of the burden of highway expenditures, producing from 55 per cent to 70 per cent of the total highway revenue.
5. The major portion of the burden on real property is due to local and county taxation of real property for highway purposes. The local units produce 46.54 per cent; county units, 42.47 per cent; and the state, 10.99 per cent of the real property revenue for highway expenditures.
6. Real property contributes a larger share of highway revenue during periods of depression, when the revenue from other sources decreases. This results in an excessive levy on real property owners, since the tax levy on real property is paid from income derived from the property, and in periods of low prices this income is reduced at least as much as income from other sources.
7. When income tax funds increase within a county, real property taxation for highway purposes decreases.
8. As a county develops and grows richer, the relative burden on real property for highway purposes decreases. When a county or state is in the developmental stage, the cost of the permanent features of highway improvements can be economically financed by issuing a limited number of deferred serial highway bonds. By this method the burden on property is lightened during the early years of the improvement, increasing with the ability of property to produce more revenue as a result of the highway improvements.
9. A reduction of elimination of state taxation of real property for highway purposes in Wisconsin would not materially reduce the total of real property taxation for all highway purposes.
10. Reduction of real property taxation for highway purposes in Wisconsin would result largely in a reduction of local and county taxation of real property for township and county highway expenditures.

How Can Real Property Taxation for Highway Improvements Be Reduced?

The two logical sources of highway revenue are real property taxation and vehicle license and gasoline taxation. When real property taxation produces too large a share of highway revenue in comparison with the share produced by vehicle license and gasoline taxation, there are three courses which may be followed:

1. The elimination of inefficiency and waste in the expenditure of highway funds by the local and county units. Of all real prop-

Dependable

BAKER SNOW PLOWS
For Motor Trucks and Tractors

It is easy to select your snow plows from the many models, types and sizes in the big Baker line. You can depend on getting Baker quality in any plow whether for Fordson, motor trucks or the big tractors.

Mr. Brehm, Director of Public Works, City of Waltham, Mass., says: "Baker Plows did excellent work in our city and I know of no case where they were laid up at any time for repairs and if I were purchasing more, I would certainly buy Baker Plows."

Make your selection early—don't wait too long. Snow blockades are dangerous and increase fire hazards. Our big interesting catalog will be sent free on request. You are under no obligation in writing.

Baker Mfg. Company
503 Stanford Ave.
Springfield, Illinois

erty tax funds for highway expenditures 89.03 per cent is raised by the local and county units. Any reduction in expenditures by eliminating the waste of highway funds will result in a reduction of the burden on real property for highway expenditures. This may be accomplished as follows: (1) provide for strict supervision by the state highway department over the construction and maintenance of purely county highways; (2) provide for close supervision by the county units over township highway expenditures, possibly limiting the maximum expenditures by the local units for highway expenditures to a fixed percentage of the township property valuation.

2. A reduction in the total yearly highway expenditures—township, county and state.

It is obvious that the present county and state expenditure for highway improvements lags behind the need for improved highways and is not a desirable solution of the problem.

3. Shift part of the burden of highway improvements from real property to other sources of revenue.

By substituting other sources of revenue for a portion of the real property revenue, we cannot decrease the total revenue raised by the various units necessary for purposes other than highway improvement. A reduction in the amount of highway improvement revenue raised from the taxation of real property without raising a like amount from some other source of revenue would result in a reduction of the total highway funds below a necessary minimum. The logical solution is to increase the total revenue raised from old or to create new sources of revenue for highway improvement to replace the revenue lost by the lowered taxation of real property. The source of this increased revenue is the highway user, where demand for highway service is largely responsible for highway improvements.

An Argument for Regional Planning

THE following statement issued August 12, 1924, by C. B. Whitnall, Secretary, Milwaukee County Park Commission and Rural Planning Board, while referring particularly to the Milwaukee region, may be helpful to other communities which are awaking to the importance of regional planning:

"Milwaukee's future welfare depends very largely upon its foresight in the promotion of health and comfort for all who are dependent upon the activities contributing to the city's prestige. Also, on the promotion of efficiency, with economy, in the conduct of its industrial pursuits. Neither of these two most vital factors can possibly be accomplished within areas limited by chance jurisdiction of political bias.

"Inflated values, loss of time, and devitalized atmosphere make decentralization imperative. In effecting this decentralization, our industries must be provided for, for their ability to serve the outside world with greater economy and efficiency is our stability. The skill and manhood upon which our industries are dependent must also be provided for. Taxation which accomplishes these beneficial results will not be burdensome, while taxation failing in this respect, even though less in amount, becomes intolerable.

"City planning is serving its purpose, but its scope of activity is by far too circumscribed to provide for the decentralization which is so urgent. The most efficient and economical decentralization possible requires the careful allocation of lands to their most appropriate use, for which we find the whole metropolitan area of our county none too large. The problems which affect each community of the metropolitan area are regional problems. The development of common arteries, location and development of industrial areas and their balancing with residential areas, with requisite park influences and recreational facilities, are more vital to the city of Milwaukee than anything it can possibly do within its own limitations. Without prompt relief disintegration will be inevitable.

"The only salvation for Milwaukee's future is the careful development of its regional or contributing areas, by an orderly comprehensive plan. One of the most serious responsibilities of the Milwaukee Common Council is its cooperation in regional planning, the whole intent of which is to secure that unity of metropolitan consciousness, that conception of the magnitude of the task of adequate planning for the future and the willingness to work together, which will carry forward a great and fundamental program. Narrowness, selfishness, or self-sufficient tendencies are badges of inefficiency, and are never in harmony with constructive ability.

"Milwaukee's industries at present are not functioning to the best possible advantage. The whole metropolitan area is the loser, and it makes very little difference within which of the sixteen independent political boundaries within Milwaukee County an industry is located. Such inefficiency deters progress of the whole, for there exists an interdependence between all these political entities which our County Government recognizes, and will endeavor to harmonize.

"The adjustment of present discords must be broad and comprehensive enough to attract the further investment of millions now seeking locations, particularly since the termination of the Pittsburgh Plus Plan. Our invitations to capital and skilled labor must represent us as a homogeneous whole, not as discordant units."

A single snow can cost millions

A city's business losses in a single snow storm may run into millions of dollars. They did in New York. But more important, and harder to estimate, is the loss to life and property, should fire trucks be held up for an hour in getting to a single fire.

Snow is rain, expanded ten times—yet a hundred times harder to remove, and a thousand times more of a menace. Men, even if they could stand the strain of day and night work, could not shovel fast enough to prevent severe traffic tie-ups and their consequent losses.

In Chicago, comparative performances on snow loading show that a Barber-Greene Snow Loader is 48 times faster than hand labor, or that it does the work of 192 shovelers. It took 4 shovelers 10 minutes to load a 3-yard wagon, while a Barber-Greene loaded an 8-yard truck in 20 seconds.

Such tests, made each winter in cities all over the country, show that the Barber-Greene has brought about a heretofore unheard-of speed and efficiency to snow removal.

During a Springfield, Massachusetts, snow storm last winter, a Barber-Greene kept seventeen 5-ton trucks busy, and could have gone faster. Over a period of 6 hours, an average of a truck every 2 minutes was maintained.

The Barber-Greene is quickly transformed into a bucket loader, and is then ready for summer road work. Working on a St. Louis street paving job, a Barber-Greene Bucket Loader replaced 12 men and sped up the work 50%.

"Snow Insurance" will show you how cities large and small have eliminated the snow menace, and how the Barber-Greene is saving them substantial sums on summer paving work. Send for it.

BARBER-GREENE COMPANY—*Representatives in Fifty Cities*—515 W. Park Avenue, Aurora, Illinois

BARBER GREENE

Portable Belt Conveyors — Self Feeding Bucket Loaders

Coal Loaders . Automatic Ditch Diggers — Snow Loaders . . . . Coal Feeders

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

Hints, Helps and Happenings

Tenure of Office of 2,170 City Clerks

IN reply to an inquiry from THE AMERICAN CITY, 2,170 city clerks in the United States and Canada have furnished information as to the number of years which they have occupied their present positions. In the list there are 17 veterans who have seen 30 years or more of continuous service. These are:

Date of Appointment	Municipality	City Clerk
1874	Milford, N. H.	James M. Laws
1876	Cedarburg, Wis.	F. G. Schuette
1879	Winnipeg, Man.	C. J. Brown
1894	Hearne, Tex.	W. W. Bivin
1886	Pepperell, Mass.	Frank R. Bennett
1886	Monroe City, Mo.	Geo. W. Tompkins
1887	Elmira, Ont.	John H. Ruppel
1889	Canton, N. Y.	Herbert M. Barber
1889	Polo, Ill.	George H. Butts
1891	Hollidaysburg, Pa.	Robert W. Smith
1892	Victoria, B. C.	E. W. Bradley
1892	Albion, Pa.	S. A. Collins
1892	Bellevue, Pa.	J. M. Simeral
1892	Champlain, N. Y.	N. P. St. Maxens
1894	Morganfield, Ky.	A. F. Waller
1894	Cameron, W. Va.	J. S. Fish
1894	Fox Lake, Wis.	Wm. F. O'Connell

Of the rest, 67 have held their present positions for from 20 to 29 years; 188 have a record of 10 to 19 years; 303 of 5 to 9 years, and 1,595 have thus far had less than 5 years of service.

Pittsburgh Against Destructive Taxes

IN 1697 the British Government levied a tax on houses according to the number of windows. It lasted until 1851. It was then seen to be a tax which destroyed windows and shut out light from houses and injured the health of women and children especially. Windows were destroyed by taxation. The tax showed darkness in governmental minds and produced it in homes.

In Egypt once, the government, arguing that incomes came from date trees, taxed them. Thousands of date trees were cut down to avoid taxation, the government lost taxes, and the people starved for dates.

The power to tax is the power to destroy. A tax on date trees destroys the trees. A tax on windows destroys windows. A tax on incomes destroys incomes. A tax on improvements destroys the purpose to improve.

In Pittsburgh, the city is trying to avoid the destruction of desirable things by taxation. There is no state tax in Pennsylvania on real estate or personal property. Now the city has reduced its tax on improvements until they pay only 60 per cent of the rate on land values. If you owned a factory on a $10,000 site in Pittsburgh, with buildings on it worth $10,000, with machinery, raw materials and finished goods worth $50,000, your taxes would be $190 on the land value, $114 on the building, and nothing at all on the goods on hand, making a total of $304.

Next year the tax on buildings and improvements will be reduced to 50 per cent of the rate on land values. And Pittsburgh seems to like the idea.

It is a guarantee that the things produced by industry will not be destroyed by taxation, as the date trees were in Egypt and the windows in England.

The thing which this system tends to destroy is land monoply; for the burden rests more and more heavily on sites. But this is beneficial to industry.

"Come to Pittsburgh," says this policy in taxation. "We levy taxation so as not to destroy industry, but to do away partially with monopoly of natural opportunity, the foe of industry. We try not to kill the good thing."

Taxation is destruction—of something.

An editorial by Herbert Quick, published September 6, 1924, in *Pittsburgh First*, the official weekly organ of the Pittsburgh Chamber of Commerce.

Program for American Education Week

THE American Legion, the United States Bureau of Education and the National Education Association are again cooperating in plans for American Education Week, which this year is to be observed November 17 to 23. The designations of the seven days of the week, and the descriptive phrase adopted for each, are as follows:

MONDAY—CONSTITUTION DAY.—"Our Constitution—The Bulwark of Democracy and Happiness."

TUESDAY—PATRIOTISM DAY.—"The United States Flag is the living symbol of the ideals and institutions of our Republic."

WEDNESDAY—SCHOOL AND TEACHERS' DAY.—"The Teacher—the guiding influence of future America."

THURSDAY—ILLITERACY DAY.—"Informed intelligence is the foundation of representative government."

FRIDAY—PHYSICAL EDUCATION DAY.—"Playgrounds and athletic fields mean a strong and healthy nation."

SATURDAY—COMMUNITY DAY.—"Service to Community, State and Nation is the duty of every citizen."

SUNDAY—FOR GOD AND COUNTRY DAY.—"Religion, morality and education are necessary for good government."

Real Estate Boards Undertaking Clean-up of Industrial Tracts

MANY real estate boards are enlisting actively in the campaign now being carried on by the National Association of Real Estate Boards through its Industrial Property Division to clean up the "back yard" of the city—the sections of its industrial plants which make the principal part of the town visible to the casual passer-through on the railroad right of way.

With the clean-up campaign is coupled a movement to make it possible for travelers to identify by name the towns they are passing through. Attractive planting along the right of way is part of the clean-up and paint-up movement in some of the cities.

Committees to undertake the alignment of local industries with the railroads in making the view from the right of way something more than ash heaps and rubbish piles have been appointed by real estate boards belonging to the Association in the following cities: New Orleans; Milwaukee;

Repairs that Reduce Upkeep

Service boxes should always be covered—for every uncovered box means an expense for cleaning out when the curb stop must be reached—and often results in damage suits for personal injury.

MUELLER

Service Box Repair Lids

are made for both new and old style Buffalo Service Boxes, and will make a perfect fit, regardless of the condition of the box top. Readily attached with the regular pentagon wrench, but cannot be removed without it—they cannot be pried or knocked off.

Write for detailed descriptions and prices.

Mueller Co., Decatur, Ill., U. S. A.

145-149 W. 30th St., New York; 1072-76 Howard St., San Francisco; 2468 Hunter St., Los Angeles

Duluth; Atlanta; Erie and Lancaster, Pa.; South Bend; Dayton; Des Moines; Trenton, N. J.; Providence, R. I.; Lockport, N. Y.; Dade City, Fla.; Warren, Ohio; Mishawaka, Ind.; Kankakee, Ill.; Madison, Wis.; Little Rock, Ark.; Arkansas City, Kans.; Ogden, Utah; Casper, Wyo.; Albany, Ore.; and Pasadena, Venice and Riverside, Calif.

Other real estate boards have held special meetings to outline what form their participation in the campaign should take.

The American Railway Development Association has passed a resolution pledging its cooperation in the realtor movement for spruce and businesslike appearances in industrial areas. Individual railroads are cooperating through their development departments. Newspapers of the various cities are helping in enlisting the public in the putting of the city's best foot foremost.

New York City Health Department Releases Health Center Film

A MOTION picture entitled "It Works" has been released by the Department of Health of the City of New York. The film shows how twenty-two agencies, headed by the Department of Health, and acting at the suggestion of the American Red Cross, have successfully organized and operated a health center in East Harlem, New York City. The film is being distributed free of charge except for transportation costs. It is a good argument in favor of health center work which should help materially in convincing a skeptical community that the work is valuable and comparatively inexpensive.

Educational Motion Pictures in Vienna

THE United States Assistant Trade Commissioner at Vienna, Ernest M. Zwickel, sends the following information concerning the use of motion pictures for educational purposes:

"The city of Vienna has appropriated the sum of 560 million crowns for the purpose of introducing motion pictures in the Vienna schools for educational purposes. The Vienna municipal authorities realize the advantages of this form of education and have decided to equip 15 schools with motion picture equipment and apparatus. These are to be known as "Schoolkinos." Nine Vienna schools were already displaying pictures for the citizens of their communities. The municipality has taken over six of these and will open nine more schools, totaling 15, in order that motion pictures may be shown for educational purposes. It is proposed to have these 15 schools open free to school children exclusively."

A City Which Is Not Seeking Mere Increase in Population

THE following paragraphs are from a recent report of the Chamber of Commerce of Berkeley, Calif., to its members:

"Again and again the Berkeley Chamber of Commerce has called attention to the thought that the primary need of sound development of a city is not numbers but quality in population. What is really essential is for the citizens to provide the facilities for a superior commonwealth, and this in itself will attract superior residents. Ample school facilities, ample playgrounds, ample parks and boulevards all cost money, but are a guarantee of bringing good neighbors to live in our midst. A municipal symphony orchestra will do a hundredfold more to attract worth-while people to visit and to live in a city than the mere advertising of the city.

"The Chamber of Commerce, in its publicity, in its publications and in its activities has been broadcasting this message to the country. Berkeley is inviting the most cultured, the most far-seeing and the most public-spirited people of the land to come here and join with us in building the city of to-morrow which will be a leader in the development of the Pacific Ocean region. We believe that the people who are coming to Berkeley in such large numbers are for the most part those who are attracted by such ideas."

A Civic Ideal for Which Men and Women Might Strive Together

It is only when men and women work together, that they can make of the individual household a completed home, a happy place where all who come therein find life abundantly.

Therefore, it will be only as men and women learn to work together that they will find the way to make of the world itself a home for all humanity, a happy place where every child and every human being shall have the opportunity and help they need—a chance for life—life more abundantly!

It is the woman's intuitive desire for purity, for all cleanliness, that leads mankind along that way.

Each woman knows that the most fundamental necessity in the right upbringing of children is cleanliness, not of the body only, but of the spirit. Women know how often girls in the crowded districts of the city are greatly tempted because they are unwilling and ashamed to bring their men friends to their own respectable homes and let the young men see the dirty streets and filthy conditions in which they live.

If the girls dare not go home, where do they go?

It does not require much imagination to understand the temptation to evil caused by such surroundings.

There is an old saying, "Cleanliness is next to godliness."

If we could really make the environment of every individual in the community clean—with their help—and keep the streets, back yards and houses permanently clean, we should have taken the first absolutely necessary step toward making possible for every one the attainment of a higher standard of life.

Cleanliness is the only strong and solid foundation upon which we can ever hope to build round all young, growing lives the environment which each one needs for perfect development.

KATHERINE BOWLKER,
President, The Women's Municipal League of Boston.

Fall maintenance saves Spring repair bills—

NOW is the time to get busy on road repairs. Don't wait for winter snows and heavy frosts to attack weak spots. Get after the bumps, holes and hollows. Make sure that your roads will be in good shape to withstand spring thaws and traffic.

"Tarvia K-P" is the universal patching material—good for every type of road. Liquid, easy to handle and apply, "Tarvia K-P" is not injured by freezing weather and no special equipment is necessary. Patches made with "Tarvia K-P" are dense, durable, and form a perfect bond with the road. And "Tarvia K-P" is exceptionally economical. "Tarvia K-P" goes further on the job—you need less per ton of stone.

On request we will promptly send you an illustrated booklet showing each step in patching with "Tarvia K-P." Address our nearest branch.

Tarvia
For Road Construction Repair and Maintenance

The Barrett Company

New York	Chicago	Philadelphia	Boston
St. Louis	Cleveland	Cincinnati	Pittsburgh
Detroit	Kansas City	Birmingham	Dallas
Minneapolis	Salt Lake City	Bethlehem	Lebanon
Youngstown	Milwaukee	Toledo	Columbus
Baltimore	Syracuse	New Orleans	Rochester

In Canada:
THE BARRETT COMPANY, Limited:

Montreal	Toronto	St. John, N.B.
Winnipeg	Vancouver	Halifax, N.S.

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

City's Liability for Accidents

SINCE the main ground upon which cities and other municipalities may escape liability for accidents is that they are engaged in governmental functions as agencies of the state, it often falls to the courts to determine whether or not a given function is governmental in character or not. A general view of the trend of judicial decision concerning responsibility for acts of officers and employees of cities appears on pages 161 and 162 of the August, 1924, issue of THE AMERICAN CITY. It remains to note some important instances in which governmental functions have been held to be existent or nonexistent.

An excellent illustration of the distinction between the exercise of governmental functions and mere ministerial or corporate powers is accorded by the decision handed down by the Iowa Supreme Court in the case of Jones vs. Sioux City, 170 Northwestern Reporter, 474. Concerning use of an automobile in connection with a municipal police department the Court said:

"A city is liable for its negligence when it acts in a ministerial or corporate capacity. . . . It seems to us that, in order that the city may escape liability, the negligence complained of must bear some just and true relationship to the enforcement of law. If this automobile was being driven rapidly to quell a riot, or to protect the lives or property of citizens, then the speed of the car would bear a true relationship to the enforcement of law. . . .

"If it be conceded, for the sake of argument, that the sole mission of the car in question and its driver was to haul policemen to their beats, could it be said that the city was acting in a governmental capacity? We think not. It could not be reasonably said that it is necessary for policemen to be hauled to their beats at the rate of 45 miles an hour, through the streets of a city. If it is a part of a city's policy to haul policemen to their beats in the outlying districts of a city, this is something which suits the convenience or economy of the city, and is an act which it does as a part of its general business, and does not relate to the enforcement of law. Such matters partake of the general or corporate business of the city."

In line with the reasoning of the Iowa court, it was decided in a Nebraska case (Opocensky vs. South Omaha, 163 Northwestern Reporter, 325) that operation of a fire department automobile on the street at an excessive speed, to test the machine, was not a governmental function.

But one of the Missouri Courts of Appeal decided that an automobile police patrol, carrying a prisoner to the police station, is engaged in a governmental mission. (Stater vs. Joplin, 176 Southwestern Reporter, 241.)

Concerning operation of motor vehicles in connection with a municipally operated public library, the Illinois Supreme Court said in the case of Johnston vs. Chicago, 101 Northeastern Reporter, 960:

"The conveyance of books from one library building to another, by means of an automobile, along the public highways, by employees of the city, is plainly a ministerial duty."

Another instructive opinion is that filed by the Nebraska Supreme Court in the case of Chaney vs. Riverton, 177 Northwestern Reporter, 845, concerning liability for street accidents. It was decided that defendant village was liable for injury to a pedestrian, caused by collapse of a platform which the municipal authorities had permitted to be placed in a street for use in connection with a Fourth of July celebration; the structure having existed long enough to fairly charge the authorities with knowledge concerning its condition. After referring to the village's statutory authority over streets—the authority being conferred in language commonly used throughout the several states in granting such powers—the Supreme Court said:

"Under this power of full control, conferred for the public good, the village was required to exercise due care in keeping its streets free from such structural defects or obstructions, or such physical conditions in immediate connection therewith, as would impair its use or endanger those traveling upon it. . . .

"In the cases just above cited, the condition produced by a brick wall of a building, after a fire, left standing next to the sidewalk, and in danger of falling on those using the street; or a billboard in a weakened or decayed condition, standing so that it might be blown into the street; or a platform built in the street, such as the one in the instant case,—was, in each case where in-

FERRY AVENUE, Detroit, Mich., paved with Trinidad Lake Asphalt in 1887.

37 years old—*still good*

Think of it! Thirty-seven years of service—still in good condition—and *very little spent on it for maintenance to date!*

This is the record of the Trinidad Lake Asphalt Paving on Ferry Ave., Detroit, Mich.—laid in 1887. *What other smooth-surface paving material can equal it?*

Trinidad is genuine, nature-made asphalt—not an artificially-produced compound. We have some interesting facts about this remarkable material. Write for them.

THE BARBER ASPHALT COMPANY

PHILADELPHIA

New York St. Louis Chicago Pittsburgh San Francisco Kansas City

TRINIDAD LAKE ASPHALT

volved, held to be a nuisance in connection with the street, and which the city was obliged to use due diligence in discovering and removing.

"Such a duty it owes in its private or corporate capacity, and not in its governmental capacity. Those cases, therefore, having to do with a nuisance created upon the street by the active use of it, such as by riots, the shooting of fireworks or cannons, or by horse races or coasting on the snow, are to be distinguished, for in such cases the nuisance has no structural connection with the street nor with the surrounding physical conditions, but is an unlawful proceeding upon the street, which the city is called upon, in its governmental capacity to prevent, and for failure to do so, since it acts in its governmental capacity, it is not held liable."

In the case of Fowler vs. City of Cleveland, 126 Northeastern Reporter, 72, the Ohio Supreme Court aptly said:

"The line of demarcation between acts which are termed governmental and those which are ministerial or proprietary, done in the performance of a corporate function, has not been accurately defined in cases where the liability of a municipality was involved. It is, of course, everywhere recognized that the exercise of the legislative will is governmental. The power to determine whether certain steps shall be taken in the interest of the public welfare is governmental, and the exercise and expression of the discretion as to the kind of steps, and the extent of them, are governmental. But a municipal corporation is a vastly different thing now from what it was in the early days. . . .

"Now, the activities and undertakings of a municipal corporation are manifold. . . . It seems to be utterly unreasonable that all these activities and enterprises which are brought closely home to the lives of all of the people of the municipality must still be regarded as bound up in the vague and uncertain sphere of what is called a governmental function. . . .

"A modern city may be said to be a great public service corporation, and no reason is apparent why, in the respects in which it intrusts purely ministerial duties to agents and employees, it should not be subject to the liabilties of such persons and companies."

Sundry Items of Municipal Law

Private Structure Erected Without Authority Over Sidewalk Constitutes a Nuisance

Where an owner or occupant of property abutting upon a street erects a private awning or shed, covered with corrugated iron and supported by posts near the curb, and extending over the sidewalk, it constitutes a nuisance, whether it interferes with public travel or not, if it is erected without legal authority. (West Virginia Supreme Court of Appeals, City of Martinsburg vs. Miles, 121 Southeastern Reporter, 285.)

County's Responsibility Concerning Bridges

In the recent case of Travers vs. Delaware County, 124 Atlantic Reporter, 496, the Pennsylvania Supreme Court decided that the plaintiff had failed to establish such negligence on the part of the defendant as to render it liable for injuries resulting from collapse of a bridge.

Speaking generally of the responsibility of counties, the Court said:

"To recover, it was necessary that lack of some due precaution for the protection of the public be established. The bridge had been in use for more than 30 years, and failure to take proper care cannot be rested on the original manner of design or building . . . for there was no evidence to show that the plan followed was so defective as to make its adoption an act of negligence. Of course, it is the duty of the county commissioners to make such inspections as are from time to time required, so that the bridges within their control—part of the public highways—are kept in safe condition, and suitable for the movement of traffic reasonably to be expected to pass across. To effect this end, they must employ suitable engineers to perform the service of inspection so that the strength of the structures committed to their care may be determined. . . . When defects are brought to their attention, necessary changes must be made, and the highway closed in the meantime if there is apparent danger. . . . To secure such result, it must take advantage of the skill of an expert of good repute, when conditions so require."

Right to Use Private Sewer as Part of Public System

Where a sewer, laid by a private owner in a public highway, connects with another sewer serving a suburban community, and the city limits are thereafter extended to include both sewers, the suburb, and other contiguous territory, that part of the highway under which the sewer is laid becoming a part of the city's system of streets, and it is found necessary in the interest of public health, convenience, and welfare for the city and its inhabitants to use such privately constructed sewer, neither the city nor its inhabitants will be enjoined from such use, where the city offers to pay to the owners a reasonable compensation for the public ownership of the sewer. (West Virginia Supreme Court of Appeals, Stifel vs. Hannan, 123 Southeastern Reporter, 428.)

Refusal of Court to Declare an Ordinance Void Merely Because It Fails to Conform to Best Engineering Practice

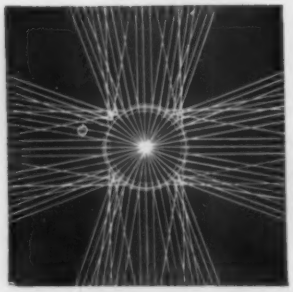
In the case of Van Hecks vs. City of Stevens Point, 198 Northwestern Reporter, 732, it was claimed that an ordinance originally establishing the grade of a street was void because it provided for a fall of one-tenth of a foot in approximately 287 feet. Responding to that contention, the Wisconsin Supreme Court said:

"We are cited to no case, and we find none, which sustains the city's position. Ordinances which are unreasonable may be declared void, but it is not within the province of a court to declare an ordinance void merely because it fails to conform to the best engineering practice."

THE AMERICAN CITY is indebted to the Boston Chamber of Commerce for the photograph taken by the U. S. Army Air Service, which is reproduced on the front cover of this issue.

Assymetrical

The word that is revolutionizing street lighting.



HOLOPHANE

4-Way and 2-Way Refractors

HERETOFORE street lighting units have distributed the light *symmetrically* around the lamp, and consequently a large part of the light has been wasted on house fronts and lawns.

Now Holophane offers two *as*symetrical units, which direct the light in only four or two directions, thus keeping the light on the street and giving from 40% to 50% more illumination from a given amount of current than have the best previous units.

Above is illustrated the light distribution of the 4-Way Refractor.

Your city should standardize on these units now. Write for booklet.

HOLOPHANE GLASS COMPANY
342 Madison Ave., N. Y. C.
Works—Newark, Ohio
In Canada—146 King St., W., Toronto

Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources
For further information, Mr. Williams may be addressed in care of
THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Zoning Ordinances and Enabling Acts Not Previously Listed

CALIFORNIA.—*Burbank (1923), *Burlingame (1923), *Glendale (1922), *Inglewood (1924), *Redwood City (1921), *San Mateo (1922), *Torrance (1923), *Ventura (1924), ordinances

FLORIDA.—*Orlando, ordinance, 1924

MASSACHUSETTS.—*Malden, ordinance, 1923

NEVADA.—Enabling Act, March 10, 1923

NEW JERSEY.—*Fanwood (1924), *Linden (1921), *Pompton Lakes (1923), ordinances

NEW YORK.—*Elmsford (1924), *Hastings (1923), *Rockville Centre (1924), ordinances

NORTH DAKOTA.—*Bismarck, ordinance, 1924

OKLAHOMA.—*Tulsa, ordinance, 1923

VIRGINIA.—Norfolk, ordinance, August 19, 1924

WISCONSIN.—*Beloit (1924), Kenosha (1924), ordinances

Recent Zoning Decisions

NEW YORK.—*City of Syracuse v. Snow*, 123 Misc. Rep. 568. Injunction to restrain defendants from conducting the business of a sorority or chapter house in a single-family use district, contrary to the zoning ordinance. Action dismissed. The running of a sorority as here conducted is not a business. The sorority is a single, private family. The prohibition of such an establishment does not tend to insure the public health, safety or welfare, and is not authorized by legislation authorizing the city to promote it. The defendant who contracted to sell her house, since she could obtain $6,000 more for it for this use than for any other, was deprived of her property without due process of law by the regulation in question.

NEW YORK.—*Welch v. City of Niagara Falls*, 210 App. Div. 170. An amendment to the zoning ordinance prohibiting a wholesale or retail coal business was passed by the council without a previous reference of the matter to the Zoning Commission, as required by the charter. *Held*, that it was not validly enacted. Nor is the passage of the amendment authorized by Sec. 56 of the charter, empowering the council to pass ordinances for the general safety and welfare. While a coal business may be objectionable in some ways, it is not a nuisance. The ordinance can only be justified as an exercise of the zoning power under zoning enabling acts. The city claims that the business can be excluded from the district under a section of the ordinance as it exists, without amendment. The interpretation of the section is not free from doubt, and as it is a restriction of the common law and of a general law to pursue a legitimate and innocent occupation, it must receive a strict construction.

WISCONSIN.—*Holzbauer v. Ritter*, 198 N. W. Rep. 852. Where the erection of a store building, in violation of a zoning ordinance, might cause special damage to property of plaintiffs not suffered by the general public, they could sue to enjoin such erection in order to prevent irreparable injury.

Where a zoning ordinance required a three-fourths vote of the council for amendments protested by property owners, and the clerk failed to present before vote, protests to an amendment excluding a community store from a residential district, the amendment was held invalid, especially in view of the statute (1923, sec. 62, 23, subs. 5 c) providing for a three-fourths vote in cases of protest.

A zoning ordinance restricting the erection of a community store in a residential district held constitutional.

Recent Zoning Literature

Bulletins of Federal Department of Commerce.—The Department of Commerce at Washington has issued a comparative statement of the use and height regulations of the zoning ordinances of sixteen cities. The statement was prepared by the Advisory Committee on Zoning, appointed by Secretary Hoover, and is a mimeograph pamphlet of twenty-six pages.

The department has also issued a "Supplement to its 'Zoning Progress in the United States' of January, 1924," giving additional zoning ordinances adopted. These ordinances, in so far as they have not already been mentioned in these notes, are (with the exception of interim ordinances) given in our list of ordinances for this month. The supplement says that the number of ordinances now in effect in this country is 261.

In addition, the department has prepared a table of the acts of states, thirteen in all, which have used the Department's standard enabling act in whole or in part, since its tentative publication in 1923. The Department is also sending out a leaflet showing recent benefit from zoning legislation. Approximately 24,000,000 people in the United States now live in zoned localities.

Baltimore Zoning Code.—Albert M. Greenfield, Esq., has prepared a book of 167 pages entitled "Zoning Code for Baltimore." It is the zoning ordinance of the city arranged for easy reference, with an appendix of rulings, court decisions, amendments and other pertinent laws and ordinances. Such books are to be found in other branches of the law, but the volume is an innovation in zoning which will be greatly appreciated by all whose business it is to know and use the Baltimore ordinance.

*The ordinances starred are listed in the "Supplement" of the Department of Commerce, referred to below.

We Are Future Voters

When we are old enough to vote, you won't have to convince *us* that playgrounds are necessary. When a playground appropriation or bond issue comes up, we'll vote Y E S, willingly and gladly.

Then what fun we'll have selecting the apparatus!

We'll have water slides and land slides, parallel bars and swings, see-saws and traveling rings, and many other good things to make our boys and girls happy and strong.

Of course we'll choose FUN-FUL, because we have *tried* FUN-FUL apparatus. We know just how *strong, durable* and *safe* it is. And everybody knows that strong, durable apparatus is most economical to buy.

HILL-STANDARD CO.
·ANDERSON·INDIANA·U·S·A·

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

THE year 1924 promises to be a record year for municipal financing. The aggregate for the first eight months of the year is $1,036,218,624. The total for the entire year 1923 was $1,111,159,388, less than $75,000,000 more than this year's figures to September 1. It is probable that the final 1924 figure will be close to that of 1921 when the peak of municipal financing was reached. The total that year was $1,383,368,900.

The final September figures will show a marked decline in comparison with previous months. Possibly many municipalities which normally would have been in the market in September and October took advantage of the July and August market to dispose of their authorized issues at high prices. The result, as indicated above, is seen in the unusual volume of borrowing in the first eight months of the year. The only offering of major importance announced for sale in September is the state of New York's $12,500,000 4 per cent Hospital Loan. This block is the initial offering of a $50,000,000 issue authorized last year.

Municipal bond price averages indicated that the market advanced gradually through August and are to-day at about the level of the fall of 1922 and not far below the high prices reached early in 1917, prior to this country's entrance into the World War:

IMPORTANT MUNICIPAL BOND SALES IN SEPTEMBER

Amount	Borrower	Maturity	Coupon Rate (%)	Net Yield (%)
1,980,000	Buffalo, N. Y.....	1925-54	4¼	3.95
1,365,500	Binghamton, N. Y..	1925-71	4¼	4.07
500,000	Johnstown, Pa.	1925-54	4¼	4.15
349,000	Camden, N. J.....	1925-74	4¼	4.16
712,500	Milwaukee, Wis.	1925-43	4½	4.17
1,960,000	Hudson Co., N. J...	1926-54	4½	4.30
2,400,000	Mississippi	1935-48	4½	4.37
1,599,000	Bayonne, N. J.....	1925-53	4½	4.41
470,000	Lowville, N. Y.....	1929-91	4½	4.42
1,000,000	Los Angeles Co., Calif.	1928-47	5	4.48
400,000	Black River Regulating Dist., N. Y...	1925-74	5	4.60
4,473,000	Salt River Valley Water Users Assn., Ariz.	1925-54	6	6.24

The Small Town's Opportunity

As Seen by Two Automobile Manufacturers

HENRY FORD, *as quoted in an interview with Drew Pearson, in the September "Automotive Industries"*:

"The modern city has done its work and a change is coming. The city has taught us much, but the overhead expense of living in such places is becoming unbearable. The cost of maintaining interest on debts, of keeping up water-supply, sewerage and sanitary systems, the cost of traffic control and of policing great masses of people, are so great as to offset the benefits of the city. The cities are getting too heavy and are about doomed.

"Industry of the future will be organized on a big scale, but competition will force it to move to parts of the country where labor is steady and overhead costs low.

"The farm has its dull season, when the farmer can come into the factory, and the factory has its dull season when the workmen can get out on the land and help produce food.

"Every man is better off for a period of work under the open sky, and while we cannot afford the time to go off for three or four months of the year to dawdle around some fancy summer resort, yet we can escape the routine of the factory and the monotony of the farm by an exchange of labor during the slack seasons."

WALTER P. CHRYSLER, *President, Chrysler Motor Corporation and Maxwell Motor Sales Corporation, in the September "Public Affairs"*:

"Seventy-five per cent of all the cars in the United States are in towns of less than 50,000. Thirty per cent are in towns of less than 1,000. Only nine per cent are in towns of more than 500,000.

"This is not surprising when it is remembered that nearly half of our population lives in towns of less than 2,500. A third of the population lives in towns of less than 1,000.

"The automobile has resulted in a shifting of population. First, it has resulted in a disintegration of urban life and the development of suburban life, and, secondly, it has been largely responsible for the beginning of the elimination of the village and the development of towns having a population of from 1,000 to 5,000.

"The resident of the village has hopped into his car and has 'taken a ride' to the next town. There he saw better churches and schools, a larger theater, more opportunity for social life, with the result that he decided to move. Many thousands of families have moved, and many have remained where they were because the city fathers saw that if they didn't want their town to disappear they would have to provide better schools and even a park and playground.

"Then the small-town resident went to a town where they had a municipal swimming pool and a municipal golf links. Again he decided to move, but again the authorities decided to build a pool and a links rather than lose its young men. So swimming pools, golf links and tennis courts are to be found in a great many places because cities without them have trouble holding their inhabitants.

"The automobile is rapidly eliminating the little red schoolhouse. To-day children attend consolidated county schools—in fact, 300,000 boys and girls ride every day to those schools in motor busses operated by counties."

SCHENECTADY
NEW YORK

Looking down Erie Boulevard with the General Electric Works in the background - - - King Standard Number 70 designed by General Electric and equipped with G-E Luminous Arc Lamps - - One hundred and fifteen King Ornamental Standards used in this installation - - - - - - - -

KING MANUFACTURING CO
ORNAMENTAL LIGHTING STANDARDS
230 South Clark St. Chicago USA

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

From the International Union of Cities

Items translated from "Tablettes Documentaires Municipales" by Stephen Child, 410 Maryland Building, Washington, D. C., to whom requests for further information regarding this source of civic documentation should be addressed

Technical Improvements in Vienna. 61.347+62.81 (43.6)

1. Municipal Baths.—The city of Vienna to-day has 38 bathing establishments, 20 of which are furnished with warm water; 18 have merely out-of-door facilities.

2. Public Laundries.—The keeping in good condition of the linen used in the numerous municipal establishments makes it more and more necessary to establish a great steam laundry. This purpose has been achieved through the purchase and extension of former military laundries.

3. Municipal Repair Shops.—These have for their object the making of all sorts of repairs to both machines and buildings owned by the city. It is interesting to note that in these shops arrangements are made for apprenticing war orphans and teaching them useful trades.

4. Water-Supply.—This is assured through 18 reservoirs with a total capacity of 333,300 cubic metres. What is quite exceptional is that the entire supply is from springs. To the water distribution or pumping-stations are attached supply yards for the storage and testing of pipes.

Aspect of the Street.—Construction on Empty Lots Between Buildings—Germany. 71.311 (43)

The German Public Academy of City Planning notes that of late years the intervals between the high buildings along various streets are often filled with small houses occupied by one family, leaving above them the bare walls and high roofs of the neighboring buildings. Since regulations now in force have not permitted up to the present time the making of any opposition to such disfigurements of the street, all authorities responsible for such condition are urged to make an effort to remedy this state of affairs as soon as possible by means of ordinances. Whenever possible, they should negotiate with those intending to build such structures and propose an exchange of the lot for another situated in a district reserved for low building.

Urban Esthetics.—Accessories of the Street—Paris, France. 72.509.25 (44.361) (079.1)

On the occasion of the forthcoming Exposition of the Decorative Arts, the city of Paris is organizing a competition in regard to fixed or movable furniture and other objects along the public streets and promenades, such as kiosks, benches, lighting apparatus and various other small structures, examples of which of the present day go back for the most part to the Second Empire and harmonize quite badly with the decorations of the Capitol of France. The competition is open to all French people and closes the 11th of October, 1924. A public exhibition of all the projects received will follow the decision of the jury. The designs and models of the projects given prizes will be exhibited in the pavilion reserved by the city of Paris at the Exposition of Decorative Arts in 1925.

Municipal Mortgages in North Holland. 33.332 (492.62)

While recent government orders have stopped construction by building societies and by towns, it is interesting to note that the city of Amsterdam has adopted orders which assure the completion of a new district—West Amsterdam—which will include at first 400, later 2,000, and finally 6,000 workmen's houses. The funds will be loaned by a reliable bank up to two-thirds of the value of the property pledged as security, the city guaranteeing the payment of the interest and the amortization of the loans.

The Reconstruction of Belgrade, Serbia. 33.332 (497.1)

Many great new buildings have been reconstructed with modern comforts at Belgrade, due in part to private initiative but in part also to the impulse given by the law in regard to obligatory construction of buildings. Soon large and sumptuous public buildings will also embellish the city under the provisions of the same law.

Building Regulations in Holland. 35.177:61.485 (492)

Municipal building regulations vary greatly from one city to another in Holland to such an extent that no two are alike on all matters generally regulated: floor area of houses and apartments; height and other dimensions of buildings affecting light and air; thickness of walls, details of stairways, etc. A writer in the *New Rotterdam Courant*, noting these divergencies, suggests a uniform ordinance for the entire country. There is, however, considerable opposition to this suggestion, for the question is a complex one with many aspects. The tendency in England to set up essentially uniform health regulations and enough variation in other regulations to fit the diverse conditions of rural towns and large cities is approved.

The Purification of the Water of Swimming Pools. 61.347

A Special Committee of the Royal Sanitary Society of London, England, has been studying this question very thoroughly and now reports the following general conclusions: Mechanical aeration and filtration give excellent results. The water of a swimming pool aerated and filtered in a continuous manner is bacteriologically superior to water of a pool not treated and renewed at regular intervals. Such water becomes dirty in a day or two and becomes excessively dirty if it is used for several days. As a measure of extraordinary precaution it is advised to treat the water of swimming pools with chlorine at the end of a long period of warm weather when the pool is much used and when the social conditions of those using it are not good.

From the point of view of economy, an installation of mechanical filtration and aeration is almost always more economical than a daily renewal of the water of the pool with pure water. From the point of view of health, even with suitable mechanical filtration methods installed, it is better to totally renew the water every 4 or 6 weeks in summer when there are many bathers. It is well to profit by this process of completely renewing the water to thoroughly clean the pool. All persons entering the pool should be clean and to this end shower- and other baths should be installed.

Improved Apparatus for the Treatment of City Waste in France. 62.849 (44)

Improved apparatus has been developed in France for drying and sterilizing city waste before incineration in order to save the greatest amount of heat possible. This apparatus consists of a long oven in the form of a tunnel with double walls, in which a movable metallic platform slowly circulates, carrying the wastes to be dried. Between the two walls hot gas circulates, raising the temperature of the interior of the tunnel to more than 200° C. On coming out of the tunnel the completely dried dirt falls onto a horizontal conveyor where sorting is accomplished by hand, and is then conveyed to a sieve (3 to 5 millimeter mesh) which removes about 15 per cent of the cinders. Finally, they are spread on a special grating where they may burn freely. The cinders gathered together, still hot, are heaped up outside, where they become completely oxydized. When ground this product lends itself to the manufacture of ceramic products, when mixed with a small quantity of very plastic clay and the mixture moulded, compressed and burned at a temperature of 900° C.

Housing Colonies and Improvement of the Soil at Zurich, Switzerland. 71.43:63.15 (494.34)

Important work in regard to the improvement of soil conditions, as well as the establishment of housing colonies, has lately been undertaken at Zurich. The improvement of the soil dates from the last years of the war, when the need for food supply and for furnishing occupation for those out of work made the improvement of waste areas important. Marshes were drained and rendered suitable for crops. The work was accomplished in part by the Technical Bureau of the canton and in part by the Agricultural Industrial Institute. From these sources later, there was developed the "Union for Colonization" of the interior of the canton. After the work of improvement of the soil was completed, the "Union" devoted itself to the colonization of the districts newly opened to cultivation. This colonization is in part of an urban industrial nature and in part of an agricultural nature, and in both cases the tenants may acquire ownership of the property. This soil improvement work and these housing colonies are, in fact, improvement works in the best sense of the word; as a result, wealth is created which will have a very beneficial effect in the near future.

The Problem of Removing Snow from City Streets or Country Roads is easily solved by using a

CHAMPION SNOW PLOW

Attached to a White Truck. Easily and quickly attached to or detached from any Standard Truck. Steel Construction insuring ample strength, a quick and positive Lifting Device, a Tilting arrangement for the Blade, and other valuable features make the Champion the most practical and Popular Snow Plow on the market.

Used and endorsed by Towns, Counties, Cities, States and Industrial Plants in all Northern States.

Saves its Cost after one heavy snow.

Ask for Latest Snow Plow Catalog. It will interest you.

NEW YORK, N.Y.
WATERTOWN, MASS.
PHILADELPHIA, PA.

The
GOOD ROADS MACHINERY Co
INC.
KENNETT SQUARE, PA.

CHICAGO, ILL.
PITTSBURGH, PA.
PORTLAND, ORE.

Municipal and Civic Publications

Prices do not include postage unless so stated

Hydraulics Applied to Sewer Design.—By G. S. Coleman, Senior Lecturer in Municipal and Sanitary Engineering, the Municipal College of Technology, Manchester, England. D. Van Nostrand Company, New York. 1923. VIII + 150 pp. Diagrams, tables. $4.00.

A well-prepared treatise on the application of the theory of hydraulics to sewer design, based on the author's English experience and considerable material borrowed from standard American text-books and periodicals. The specific chapters are devoted to a general discussion of data for use in calculations, a discussion of various discharge formulae for channels, and the discharge of weirs. Five appendices develop the theoretical formulae used in the text.

Emergency Water Supplies for Military, Agricultural and Colonial Purposes.—By A. Beeby Thompson, Attached to Headquarters Staff of Mediterranean Expeditionary Force, British Army, 1915-1919. D. Van Nostrand Company, New York. 1924. XII + 180 pp. $6.50.

A book based on experience gained during the operations of the Mediterranean Expeditionary Forces, 1915-1919, and containing special reference to the use of tube wells and drilling. This book is published with the consent of the British War Office, as it is impossible to publish this material as an official publication. The experience of the author gave exceptional opportunities for continuous and close study of highly diversified water problems, upon the solution of which the health of troops and animals often depended. The book is not intended as a text-book on hydrology, but contains a concise statement on the principles guiding water prospecting. Particular attention is given to tube wells, which had previously been neglected, but which it was found could supply large quantities of water at two hours' notice.

Sheffield: A Civic Survey and Suggestions towards a Development Plan.—Report by Patrick Abercrombie, of the Department of Civic Design, University of Liverpool, on the scheme prepared for the Development Committee in collaboration with R. H. Mattocks. Published for The University Press of Liverpool Limited, by Hodder and Stoughton, Limited, London. 1924. XI + 85 quarto pp., besides many views, maps and drawings. 20 shillings.

An elaborate presentation of the facts regarding Sheffield's topography, history, population, industrial, traffic and transportation conditions, its health and housing, and its business, educational and recreational facilities, with plans for the future development of the city. The proposals for this development are grouped under the divisions of zoning, road suggestions, grouping of the population, central improvements, park system, neighborhood centers and satellite suburbs, modern methods of suburban growth, intellectual and artistic center, improvement of water transport, and railways.

Elements of Land Economics.—By Richard T. Ely, LL.D., Director of the Institute for Research in Land Economics and Public Utilities, and Professor of Economics in the University of Wisconsin; and Edward W. Morehouse, M. A., Research Instructor in the Institute of the University. The Macmillan Company, New York. 1924. XVIII + 353 pp. Views, maps, diagrams. $3.50.

This is Volume II in the Standard Course in Real Estate, outlined by the Joint Commission representing The National Association of Real Estate Boards, the United Y. M. C. A. Schools and The Institute for Research in Land Economics and Public Utilities. The books in the Land Economics Series, to which this volume furnishes an introduction, will deal, first, with land as an economic factor, and second with land as a commodity. Improvement of the social conditions of living should be the purpose of policies and plans of land utilization. This book is a study of how this end may be accomplished.

The Design and Operation of Sewage Pumping Stations.—By C. S. Timanus, of Burns and McDonnell Engineering Company. A paper presented at the Fifth Conference on Sewage Treatment, held at Ames, Iowa, October 22-24, 1923. Bulletin 62 of the Engineering Extension Department, Iowa State College, Ames, Iowa. Published November 14, 1923. 9 pp. Illustrated. A general, yet definite discussion of the subject. (Apply to the Engineering Extension Department.)

Elements of Water Bacteriology.—By Professor Samuel Cate Prescott and Professor Charles-Edward Amory Winslow, of the Massachusetts Institute of Technology, and the Yale School of Medicine, respectively. Fourth Edition, rewritten. John Wiley & Sons, Inc., New York. 1924. VIII + 211 pp. $2.25.

This book, which has nearly reached its majority, has long since been accorded first place as the standard text and reference book on water bacteriology. The rapid progress of this branch of applied science necessitated the editions of 1908 and 1915. The present book has important changes in its text relating to the increased definiteness and precision in the use of the colon test to the isolation of the typhoid bacillus, and a revised bibliography on the subject of water bacteriology. The authors presuppose the reader's knowledge of the Standard Methods of Water Analysis of the American Public Health Association, hence several of the chapters have been condensed and the space devoted to new recommendations.

Non-Voting—Causes and Methods of Control.—By Charles Edward Merriam and Harold Foote Gosnell, Professor and Instructor, respectively, in Political Science in the University of Chicago. The University of Chicago Press, Chicago. 1924. XVI + 287 pp. 1 illustration. $2.50.

Six thousand non-voters in the Chicago mayoralty election of April 3, 1923, were interviewed in the investigation for this study made under the auspices of the Local Community Research Committee of the University of Chicago, and additional data were secured from Federal and local political officials and election workers. The book contains definite, first-hand, human information of value to civic leaders, students of government, and present and potential voters. It classifies the causes of non-voting under the heads of physical difficulties, legal and administrative obstacles, disbelief in woman's voting, disgust with politics and other disbeliefs in voting, and general indifference and inertia, and it suggests methods of controlling non-voting.

Seasonal Operation in the Construction Industries—The Facts and Remedies.—McGraw-Hill Book Company, Inc., New York. 1924. XXX + 213 pp. Diagrams, tables. $2.50.

Report and recommendations of a committee of the President's Conference on Unemployment, with a foreword by Herbert Hoover, who says in his analysis of the committee's report: "For most types of construction it is now possible to build the year round in all parts of the United States"; and "Public works are especially well adapted for scheduling with reference to seasonal as well as cyclical conditions, and the efforts to encourage long range planning of public works deserve the support of the public, legislators and administrative officials." Cooperative action among the trades, the professions and the public in planning a more even demand for construction work and in eliminating waste is shown to be essential, and the problem one for individual and community initiative, not for government regulation.

The Government of Cincinnati and Hamilton County.—A Survey directed and edited by Lent D. Upson, Director, Detroit Bureau of Governmental Research; Professorial Lecturer in Political Science, University of Michigan. 1924. 535 pp. Apply to Mr. Upson or to the City Survey Committee, Citizens Bank Building, Cincinnati, Ohio.

A report to the Republican Executive and Advisory Committee of Hamilton County, Ohio, by the City Survey Committee, based upon a survey of the governments of the city of Cincinnati and Hamilton County, and of the business activities of the Board of Education. Including suggestions for the more economic and efficient administration of the city and county governments, for the coordination of city and county activities, and additional sources of revenue, and reports on the budget procedure, business methods and building construction of the Board of Education.

Additional Ground-Water Supplies for the City of Enid, Oklahoma.—By B. Coleman Renick. Water-Supply Paper 520—B, published by the United States Geological Survey of the Department of the Interior, Washington, D. C. 14 pp. Illustrated. This survey of sources for increased water-supply does not cover estimates of the costs of installation. (Apply to the Government Printing Office, Washington, D. C.)

International Motor Trucks

—are used by many Municipalities

INTERNATIONAL Model 103, illustrated, is a most efficient unit for heavy hauling. The heavy-duty models are built in 3,000, 4,000, 6,000, and 10,000 pounds, maximum capacities, with bodies to meet every requirement. The International Speed Truck, built for loads up to 2,000 pounds, is a popular favorite for fast, light hauling. Upon request, we will gladly supply you with detailed information and the address of the nearest showroom where the full line of new models is on display.

Prominent International Owners Include the Following:

Chicago Tribune
New York News
American Telephone and Telegraph Co.
New England Telephone Co.
Fleischmann's Yeast Co.
Sherwin-Williams Co.
Standard Oil Co.
Sinclair Oil Co.
Mid-Continent Refining Co.
National Refining Co.
Prairie Pipe Line Co.
Magnolia Petroleum Co.
Indian Refining Co.
Tidewater Oil Co.
Dominion Express Co.
Crane Co.
Blue Valley Creamery Co.
Armour & Co.
Cudahy Packing Co.
Missouri, Kansas & Texas Railway
Pennsylvania Railway
Southern Pacific Railway
Illinois Central Railway
Union Pacific Railway
Canadian Pacific Railway
Atchison, Topeka & Santa Fe Railway
Chicago, Burlington & Quincy Railway

INTERNATIONAL HARVESTER COMPANY OF AMERICA

(INCORPORATED)

606 So. Michigan Ave. **Chicago, Ill.**

The Present Status of Stream Pollution in Iowa.—By H. V. Pedersen, State Sanitary Engineer. A paper presented at the Fifth Conference on Sewage Treatment, at Ames, Iowa, October 22-24, 1923. Bulletin 63 of the Engineering Extension Department, Iowa State College, Ames, Iowa. 9 pp. Illustrated. Setting forth the great need of a definite stream pollution program in Iowa, and the means by which such a program may be undertaken. (Apply to the Engineering Extension Department, Iowa State College, Ames, Iowa.)

Water-Supply, Spartanburg, S. C.—Report, dated January 5, 1924, by P. H. Norcross, consulting engineer, upon the existing conditions, and conclusions and recommendations as to the best program for future development of the water-supply of Spartanburg. Also a brief supplemental report with the recommendation that detailed plans be prepared immediately and the necessary property, water rights and rights of way secured. 51 quarto pp. with tables, besides many maps and diagrams. (Apply to P. H. Norcross, consulting engineer, 1404 Candler Building, Atlanta, Georgia.)

Municipal Reports Received

BUFFALO, N. Y.—Annual Report, Department of Health, 1923

CEDAR RAPIDS, IOWA.—Report on Water-Works Improvements Authorized March 27, 1922

COLUMBUS, GA.—Report of City, 1922, 1923

DAYTON, OHIO.—Annual Report, 1923

EAST ORANGE, N. J..—Annual Report, 1923

FALL RIVER, MASS.—Annual Report, Board of Health, 1923

HERKIMER, N. Y.—Annual Report, Municipal Commission, year ending February 29, 1924

HOLYOKE, MASS.—Annual Report, City Treasurer, 1923

MONTCLAIR, N. J.—Annual Report, Board of Health, 1922

SAINT LOUIS, MO.—Annual Report, City Plan Commission, year ending April, 1924

ST. PAUL, MINN.—Annual Report, Bureau of Civil Service, 1923

SPRINGFIELD, VT.—Annual Report, Town Officers, year ending February 1, 1924; Annual Report, Village Officers, year ending March 8, 1924

TULSA, OKLA.—Annual Report, Engineering Department, year ending May 1, 1924

On the Calendar of Conventions

OCTOBER 6.—WORCESTER, MASS.
Massachusetts Federation of Planning Boards. Annual conference. Secretary, Arthur C. Comey, Abbot Building. Harvard Square, Cambridge, Mass.

OCTOBER 6-9.—WASHINGTON, D. C.
American Institute of Park Executives. Annual convention. Secretary-Treasurer, Will O. Doolittle, Box 548, Minot, N. Dak.

OCTOBER 6-9.—WASHINGTON, D. C.
American Red Cross. Annual convention. Secretary, Miss Mabel T. Boardman, National Headquarters, Washington, D. C.

OCTOBER 6-9.—LAWRENCE, KANS.
Southwest Water Works Association. Annual convention. Secretary, R. D. Morgan, Mexia, Tex.

OCTOBER 6-10.—ATLANTIC CITY, N. J.
American Electric Railway Association. Annual meeting. Executive Secretary, James W. Welsh, 8 West 40th Street, New York, N. Y.

OCTOBER 6-10.—MONTEREY, CALIF.
League of California Municipalities. Annual convention. Executive Secretary, William J. Locke, 564 Market Street, San Francisco, Calif.

OCTOBER 8-10.—WASHINGTON, D. C.
American Civic Association. Annual convention. Secretary, Miss Harlean James, Union Trust Building, Washington, D. C.

OCTOBER 8-10.—EMPORIA, KANS.
League of Kansas Municipalities. Annual convention. Secretary-Treasurer, John G. Stutz, Lawrence, Kans.

OCTOBER 13-15.—LOS ANGELES, CALIF.
American Association of Port Authorities. Annual convention. Secretary, Tiley S. McChesney, Room 200, Court Building, New Orleans, La.

OCTOBER 14-16.—KANSAS CITY, MO.
American Child Health Association. Annual meeting. Secretary, Dr. Philip Van Ingen, 370 7th Avenue, New York, N. Y.

OCTOBER 14-17.—AUGUSTA, GA.
International Association of Municipal Electricians. Annual convention. Secretary, W. R. Arbuckle, Bayonne, N. J.

OCTOBER 16-17.—CHICAGO, ILL.
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, Urbana, Ill.

OCTOBER 16-17.—COLUMBUS, OHIO
Ohio State Conference on City Planning. Annual conference. Secretary-Treasurer, Charlotte Rumbold, 201 Chamber of Commerce Building, Cleveland, Ohio.

OCTOBER 16-21.—ATLANTIC CITY, N. J.
Playground and Recreation Association of America. Annual Recreation Congress. Secretary, H. S. Braucher, 315 Fourth Avenue, New York, N. Y.

OCTOBER 20-22.—WASHINGTON, D. C.
National Association of Commercial Organization Secretaries. Annual meeting. Secretary-Treasurer, Raymond B. Gibbs, Chamber of Commerce, Kansas City, Kans.

OCTOBER 20-23.—DETROIT, MICH.
American Public Health Association. Annual meeting. Secretary, Homer N. Calver, 370 Seventh Avenue, New York, N. Y.

OCTOBER 22-24.—ANDERSON, IND.
Indiana Municipal League. Annual meeting. Secretary, Mrs. Bessie B. Ross, City Clerk, Gary, Ind.

OCTOBER 23-25.—DETROIT, MICH.
American Society of Civil Engineers. Fall meeting. Assistant Secretary, Z. E. Beam, 33 West 39th Street, New York, N. Y.

OCTOBER 27-31.—BRIARCLIFF MANOR, N. Y.
Illuminating Engineering Society. Annual convention. General Secretary, Norman D. Macdonald, 80th Street and West End Avenue, New York, N. Y.

NOVEMBER 5-8.—HOUSTON, TEX.
Texas Association of Sanitarians. Annual Short School for Sanitarians, in cooperation with the Texas State Board of Health. Secretary, E. G. Eggert, Texas State Board of Health, Austin, Tex.

NOVEMBER 7-11.—COLUMBUS, OHIO
American Country Life Association. Annual conference. Secretary, Henry Israel, Room 1849, Grand Central Terminal Building, New York, N. Y.

NOVEMBER 10-12.—CAMBRIDGE, MASS.
National Association of Civic Secretaries. Annual meeting. Secretary, Robert E. Tracy, 313 South Broad Street, Philadelphia, Pa.

NOVEMBER 10-12.—CAMBRIDGE, MASS.
National Municipal League. Annual meeting. Secretary, H. W. Dodds, 261 Broadway, New York, N. Y.

NOVEMBER 11.—NEW YORK, N. Y.
Society of Terminal Engineers. Annual meeting. Secretary, Charles H. Newman, 36 Warren Street, New York, N. Y.

NOVEMBER 13-14.—AKRON, OHIO
Association of Urban Universities. Annual meeting. Secretary, Dean Frederick B. Robinson, College of the City of New York, New York, N. Y.

NOVEMBER 17-19.—SAN FRANCISCO, CALIF.
Association of State Highway Officials. Annual meeting. Secretary, Charles Upham, State Highway Engineer, Raleigh, N. C.

DECEMBER 1-4.—NEW YORK, N. Y.
American Society of Mechanical Engineers. Annual meeting. Secretary, Calvin W. Rice, 29 West 39th Street, New York, N. Y.

DECEMBER 10-11.—WASHINGTON, D. C.
National Rivers and Harbors Congress. Annual convention. Secretary, S. A. Thompson, 824 Colorado Building, Washington, D. C.

DECEMBER 11-13.—INDIANAPOLIS, IND.
National Society for Vocational Education. Annual convention. Secretary, F. G. Nichols, Harvard University, Cambridge, Mass.

DECEMBER 26-27.—CHICAGO, ILL.
National Community Center Association. Annual meeting. Secretary, LeRoy E. Bowman, 503 Kent Hall, Columbia University, New York, N. Y.

JANUARY 5-6.—CHICAGO, ILL.
International Association of Street Sanitation Officials. Annual conference. Secretary, A. M. Anderson, 10 South LaSalle Street, Chicago, Ill.

JANUARY 6-9.—CHICAGO, ILL.
American Road Builders' Association. Annual convention and Road Show. Secretary, Ethel A. Birchland, 37 West 39th Street, New York, N. Y.

THE FIRE HAD HIM "LICKED"

REMEMBER the old timer who used to bewail the fact that the fire "had him licked before he got there?" Those were the days when fire-fighting was more luck than science, and nine times out of ten it was faulty equipment rather than the fire itself that did the "licking".

You don't hear that expression often now. Science in the manufacture of equipment has reduced the cause.

Goodrich Fire Hose is always ready when you come "rolling in." You know that its perfectly woven jacket insures uniform strength in every foot, and there is absolute safety in the long-lived rubber of its tube.

THE B. F. GOODRICH RUBBER COMPANY

ESTABLISHED 1870

Akron, Ohio

Goodrich

FIRE HOSE

"BEST IN THE LONG RUN"

News and Illustrations

Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

The Refractor in the Columbus Street-Lighting Demonstration

By T. W. Rolph

Managing Engineer, Street Lighting Department, Holophane Glass Company

THE part played by refractors in the various portions of the Columbus Street-Lighting Demonstration described in full in THE AMERICAN CITY, May, 1924, pages 478-481, is of interest. In the Columbus exhibit, three types of refractors are used, the bowl refractor, the dome refractor, and the Bilux refractor.

A street-lighting lamp not equipped with a refractor sends its light in all directions. One-half of the light goes upward, one-half goes downward, and it is equally distributed in other directions. Lamps may be equipped with diffusing glassware or redirecting glassware, known as refractors. By means of refractors light may be manipulated or redirected as desired. A portion of the upward light may be turned downward, and a portion of the downward light directed to a plane nearer the horizontal. Light can be taken from in front of the lamp and directed up the street where it is needed, or it may be directed chiefly in two directions or four directions at right angles to each other.

In the business district lighting there are nine exhibits, five of which contain Holophane refractors, as follows: On East Broad Street, where the mounting height is 30 feet, and spacing 245 feet, large standard bowl type refractors are used. They are so designed as to spread the light evenly over the street at a spacing of eight times the mounting height.

The Westinghouse demonstration of Duplex standards on High Street uses the Holophane Bilux or asymmetrical refractor. This not only turns a large part of the upward light downward, but it also turns out onto the street light which would otherwise be excessive toward the buildings. The refractor is surrounded by a globe which diffuses the light slightly.

The Westinghouse single-light standards on

DOME REFRACTOR

High Street extending north from Long Street are also equipped with Bilux refractors. These units have the same characteristics as those on the Duplex or twin-light standards.

One block of the General Electric demonstration on Front Street is equipped with dome refractors. This refractor is also surrounded by a globe which slightly diffuses the light. The dome refractor spreads the light out widely over the street, allows a considerable degree of light close to the lighting standard and sends upward a portion of the light for illuminating the buildings.

The Westinghouse exhibit on Third Street, north of Broad, consists of lantern type units containing the Bilux refractor. This refractor when used in a lantern type unit has characteristics similar to the units on High Street, which are equipped with Bilux refractors.

Of the nine thoroughfare and residence district lighting exhibits, six contain Holophane refractors. A thoroughfare-lighting exhibit of the Westinghouse Company on Neil Avenue is equipped with the same large type bowl refractors as used in the East Broad Street demonstration. A General Electric exhibit on Neil Avenue uses standards at one side of the street and has units equipped with dome type refractors surrounded by rippled glass globes. This is the same type of refractor as used on Front Street.

The Westinghouse exhibit of residence district lighting on Dennison Avenue, using units mounted

4-WAY TYPE

A SPEEDY TRUCK

EASIER ON GAS, OIL AND TIRES
—20% MORE POWER

WILLYS-KNIGHT MOTOR

$1095

Chassis f. o. b. Detroit

Here is more speed, power, economy, longer life — all built into one sturdy truck — the new Federal Knight. It cuts down delivery and upkeep costs —and is doing it for municipalities all over the country.

No other truck has the world-famous Willys-Knight Motor. No valves to grind — no carbon-cleaning. Saves 50% in upkeep. *This* motor actually *improves with use!*

No excess weight to eat up gas and wear out tires. Every inch a reliable Federal—*plus* a motor famous all over the world for power, economy and long life.

FEDERAL MOTOR TRUCK COMPANY
DETROIT, MICHIGAN

FEDERAL-KNIGHT

A SPEEDY BUSINESS TRUCK

BILUX REFRACTOR

at the side of the street, is equipped with the Holophane Superlux refractor. This refractor is of the bowl type but does not spread the light to quite such a great distance over the street as the larger bowl type used on East Broad Street.

The General Electric exhibit on Dennison Avenue has Holophane General Electric bowl type refractors. These refractors do not spread the light to quite the same distance over the street as the large bowl type, but allow more light to reach the street close to the standards.

Both the Westinghouse and the General Electric companies have submitted demonstrations of residence street lighting on Dennison Avenue, using the 2-Way refractor. The 2-Way refractor and its companion, the 4-Way refractor, mounted approximately 25 feet high at spacings of 12 times the mounting height, give as efficient resiaxle which passes under the transmission case and tain at the moderate expenditures which are ordinarily available for lighting such streets.

The use of refractors is quite general in modern street lighting installations, as through their use the designing engineer can cleverly manipulate the light, directing it in the desired directions with little loss.

A Back-Filler Attachment for Heavy Tractors

The handling of loose material quickly and effectively has been materially expedited by the development of the LaPlant-Choate Bull-Dozer or trench back-filler which will take the place of hand shoveling in leveling off the loose heaps of material at city dumps, and as an outfit for sewer and drainage contractors for re-filling trenches. Money usually spent for labor in doing this class of work will soon pay for one of these outfits and the contractor or municipality will be the owner of the outfit after the work is done. With this strong machine, water conditions do not make much difference, as, when attached to Holt, Monarch or Best tractors, it can handle even frozen material.

The LaPlant-Choate Manufacturing Company, 3015 First Avenue, Cedar Rapids, Iowa, has tried out many different devices prior to placing this one on the market. This Bull-Dozer is the result of accumulated knowledge with tractor plows and experience gained in the field. The Bull-Dozer is built to extend out far enough in front of the tractor to allow the tractor to stay on firm ground so that the blade will hang out over the edge of a deep fill and not get the tractor in the soft material. The single blade is hinged at the top so that in reversing it will be raised and will slide back without dragging any material with it. Furthermore, the blade is equipped with two steel runners on the reverse side to help it slide back.

The main frame of the Bull-Dozer is made up of two 5-inch I-beams, 16 feet long, strongly reinforced in front with two cross braces, and tied in the rear with two 5-inch I-beams which are quickly removed by means of four pins. The pivot bearings are bolted to the swing frame of the tractor and on the under side of the main plow frame. This bearing supports an off-set axle which passes under the transmission case and thence to the opposite side through bearing on the opposite side of the main frame. This method of

LEVELING A DUMP WITH A "BULL-DOZER"

You Can Have Good Roads the Year Round

THIS is the last warning before winter comes—it means much to your community if you heed it. Put your roads in good condition NOW! As but little time is left in which to do this necessary work, we urge you to act promptly.

Most of the winter and spring damage to roads is due either to poor drainage or poor surfacing. In either instance the damage is done by the water which penetrates into the road and freezes. When the spring thaws come, particularly when freezing and thawing alternate several times, the wheels of traffic soon cut deep into the road and it becomes impassable, or nearly so.

It is safe to say that for every dollar spent now in the needed protection of a road, you are eliminating the necessity of spending two dollars in the spring or summer—and you'll have good roads in spring when you need them.

Any defect which may exist in your asphalt roads should be corrected now, and macadam, gravel and dirt roads should be protected now by applying the proper grade of

Ask for this free booklet.

Standard Asphalt Road Oil

These oils, properly applied, will form a protective covering which will do much to keep them good throughout the year, particularly through the spring, when so many unprotected roads become impassable. Remember, please, that the recommendations and advise of the engineers in our asphalt department are always available. They will be glad to co-operate with you on any road problems—and their years of study and practical experience make their suggestions well worth while.

It would be a mistake to delay.
Write, wire or phone us today.

STANDARD OIL COMPANY
(INDIANA)
910 S. Michigan Avenue CHICAGO, ILLINOIS

ILLINOIS
Chicago
Decatur
Joliet
Peoria
Quincy

INDIANA
Evansville
Indianapolis
South Bend
KANSAS
Wichita

IOWA
Davenport
Des Moines
Mason City
Sioux City

S. DAKOTA
Huron
MICHIGAN
Detroit
Grand Rapids
Saginaw

N. DAKOTA
Fargo
Minot
WISCONSIN
La Crosse
Milwaukee

MINNESOTA
Duluth
Mankato
Minneapolis

MISSOURI
Kansas City
St. Joseph
St. Louis

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

THE "BULL-DOZER" BACKFILLING

suspension is balanced by putting on rocks and sand-bags on the rear of the cross-bar deck to equalize the overhanging weight of the blade. The frame is guided from the track of the tractor by means of a vertical guide attached to each side of the rear end of the tractor swing frame.

The blade is elevated by means of a worm-geared hoisting drum attached to the rear draw-bar of the tractor by an angle-iron upright. The cable is attached to the winding drum, thence through a pulley and then up to the rear cross-tie of the main frame. A flexible coupling with the shaft attached to a 16-inch hand-wheel on the upper end is attached to the winding drum. The hand-wheel is at the rear of the cab so that the driver can easily raise or lower the blade from the cab. The push blade itself is a steel blade, ¼-inch by 3 feet by 8 feet. The blade is perfectly straight, and is heavily reinforced with ⅜ x 3 x 4-inch angle irons at the top and bottom. The lower angle is reinforced with a truss rod and turnbuckle. The upper end of the blade is attached to the main frame by means of a hinged joint attached to the opposite side of the main frame beam. This allows the push blade to swing free in reversing. When the tractor reverses the push blade is automatically raised and is supported by two curved running shoes attached to the rear-side and reinforced by a brace on the under-side of the main frame. The lower face of the curved runner has a renewable ⅝ x 3-inch halfsole. The ⅝ x 3-inch iron braces on the main frame just back of the curved runner lock the blade firmly in place when the plow is in action. The curved runners give approximately a 6-inch clearance of the blade from the ground in reversing so that the blade does not drag material back with it. The lower edge of the Bull-Dozer blade is fitted with a carbon-steel grader cutting-blade bolted to the Bull-Dozer blade, and can be removed for sharpening.

Water-tight Asphalt Joints for Concrete Sewer Pipe

According to reports received from the Barber Asphalt Company, Land Title Building, Philadelphia, Pa., engineers who have been experimenting with various materials for making pipe joints in concrete or terra cotta sewer pipes have found that asphalt makes a very good joint for dry, shifting ground, wet trench conditions, and where unstable or quicksand conditions exist. At one time portland cement was used almost exclusively for making joints in sewer pipes. Recent investigations have shown that while this material makes a water-tight joint under normal conditions, the concrete is liable to crack, causing openings at the joints when the sewer pipes are subjected to the least settlement. An asphalt pipe joint is flexible and will remain tight in spite of a settlement in the sewer pipe, with the result that the infiltration of ground water into sewers during wet seasons is prevented. Water-tight joints also prevent fine roots of trees from penetrating and forcing their way into sewer pipes, thus clogging the line.

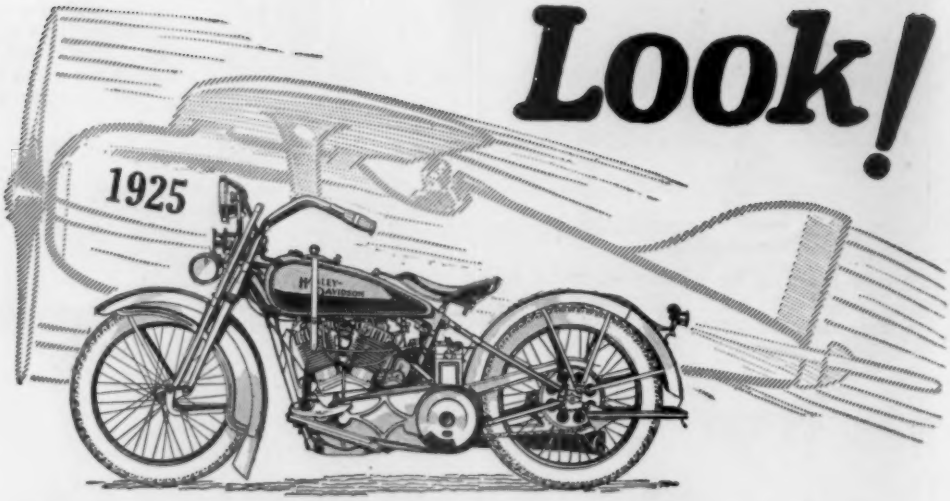
Genasco Pipe Joint Asphalt, made by the Barber Asphalt Company, has been used for a number of years for making water-tight joints in concrete and terra cotta sewer pipes. This material is said not to be affected by water, salts, acids, sewage or the usual constituents of soils. The

A UNIQUE TEST OF AN ASPHALTIC SEWER PIPE JOINT

pipe joint may be made easily and rapidly with this material. When using it the joints are first caulked with hemp or jute, after which the asphalt, which has been heated to 400 degrees, is poured into the joints to be moulded into place by the use of forms or runners. The material cools in about 15 minutes and then the runners and forms may be removed and used elsewhere. Only sufficient caulking is necessary to hold the sections of the pipe rigidly in line while pouring the pipe joint asphalt and to prevent the filler from flowing through the joint.

Replogle Purchases Warren Foundry and Pipe Company

The Warren Foundry and Pipe Company, 11 Broadway, New York City, and 201 Devonshire Street, Boston, Mass., with its foundry at Phillipsburg, N. J., has recently been purchased by the Replogle Steel Company, but will be operated under the same name and in the same manner as heretofore. The sales organization will be under the same supervision and management as formerly: J. H. Morrison, General Sales Manager, in entire charge of sales with offices located at 11 Broadway, New York City, and M. L. Northrop, New England representative with offices at 201 Devonshire Street, Boston, Mass.



New "Stream-Line" HARLEY-DAVIDSON

New Low Riding Position

New Truss-Loop Frame

New Riding Comfort

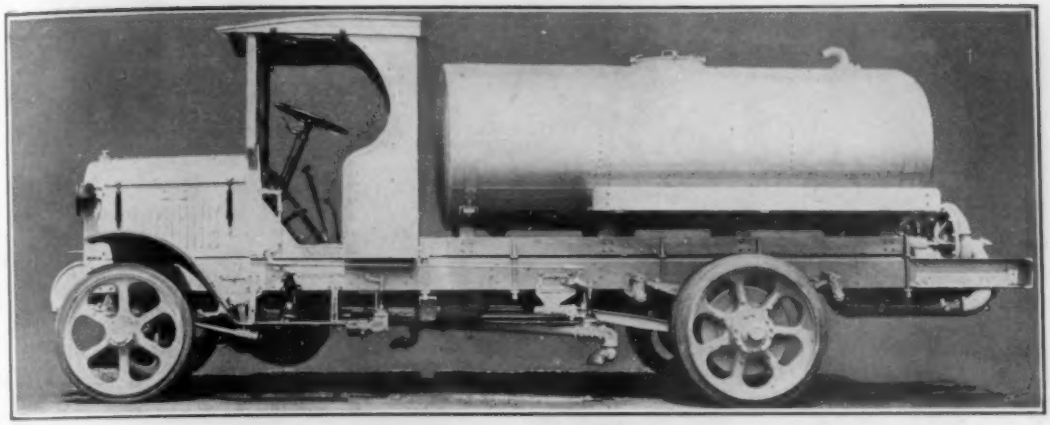
New Lower Price

SPEED in every line—strength in every curve—low-hung for safety and easy control—better-sprung and bigger-tired for luxurious comfort—that's Harley-Davidson's latest and greatest motorcycle, the "Stream-Line!"

Never a Police Mount like this before—so powerful, so speedy, so perfectly balanced, so roadworthy. From every standpoint of performance, good looks, and economy, the "Stream-Line" sets a new standard. *And yet the price is reduced!*

More than 1700 Police Departments—state, county, city and small town—are checking crime and improving police efficiency generally, by using Harley-Davidsons. See the new "Stream-Line" model at your dealer's, or write us for special illustrated literature on this newest, finest Harley-Davidson—"America's Police Motorcycle."

HARLEY-DAVIDSON MOTOR CO.
Dept. M. Milwaukee, Wis.



THE NEW GMC POWER FLUSHER

A New Street Flusher

A new 1,500-gallon capacity single-unit flusher, which embodies several new features, has recently been brought out by the General Motors Truck Company, Pontiac, Mich. The flusher has a single-unit power-plant, as distinguished from the dual-unit type commonly used. The dual-unit power-plant requires an extra engine, which is ordinarily mounted between the cab and the tank, and which is used solely to develop power for the water pump. The use of two engines automatically increases the operating and maintenance expense and adds to the first cost of the equipment.

In cases where flusher units have been built, in the past, with only one power-plant, the pump has been mounted between the cab and the tank, which makes necessary a long wheel-base and brings about poor load distribution because the heavy tank with its load of water must be pushed back on the chassis to make room for the pump. The new GMC single-unit flusher has changed this arrangement, and instead of pumps being placed in the usual location, the tank has been placed close up to the cab and the pump has been attached to the rear end cross-member of the frame. A rigid, heavy protection has been built around the pump to act as a bumper. This makes the pump very accessible and gives a much better load distribution on the chassis. The pump is driven from a power-take-off (an auxiliary gear-box) mounted on top of the transmission. This position makes the power-take-off also very accessible. The power-take-off gear ratio is 1 to 1, which means that the pump drive-shaft runs at engine speed. A straight line drive from the power-take-off to the pump is provided by a two-piece shaft with three universal joints. It is supported near the center by a self-aligning ball bearing, so that it is not affected by any frame distortion due to operation over uneven streets.

The tank is elliptical in section, being 74 inches wide, 46½ inches deep, and 130 inches long. It is made of No. 7 gage sheet steel and has welded joints. Two swash-plates are riveted in position. The water intake for filling the tank is located at the rear end and has a swivel connection for the filling hose. A tubular strainer is connected to the intake on the inside of the tank, and can be flushed out simply by removing a cap on the bottom of the tank. This is very handy and much quicker to manipulate than to remove, clean and replace a strainer on the top of the tank.

Both sprinkler and flusher connections are used. Either may be had without the other, but it works out economically to have both. A hard, crusted pavement surface will not readily respond to flushing. This same surface can be sprinkled and then a few minutes later flushed with perfect results. The nozzles are placed "amidships," in accordance with up-to-date practice. They are adjustable so that they will throw the water in the same or opposite directions, depending on the width of the street.

The K series motor and two-range transmission make the GMC chassis well adapted for street flusher use with the single-unit power-plant. The large range of speeds makes possible a flexibility of operation, depending upon the conditions of the street surface that promotes economy in both water and time. If a street is particularly bad, a sufficiently slow speed of travel can be used to make possible a finished job by going over it once. On the other hand, there are the higher speeds for streets that are in better condition.

The tank and pump are "South Bend," manufactured by the Municipal Supply Company. The equipment is mounted complete on a GMC chassis at its factory, although the chassis is not a standard job. The pump propeller shaft arrangement and pump mounting were developed by engineers of the General Motors Truck Company.

A Rescue Device for Skating-Ponds

A simple, safe and effective device for rescuing youngsters who have broken through thin ice on skating-ponds is being manufactured by the Playground Equipment Company, 225 Fifth Avenue, New York City. Altogether too many times do we see in the paper that some boy has fallen through the ice, and other boys try to pull him out by crawling to the edge of the hole, only to have the ice crumble under them, causing a number of drowning accidents instead of the loss of one life.

With this new device, which is a long lever mounted at its center on runners with a 4-foot ladder suspended at one end, it is possible for any one to very easily rescue those who have fallen through a hole in the ice and to remain at a point of perfect safety himself. The device is pushed toward the hole until the ladder can be caught by the youngster who has fallen in. By pressure at the other end of the lever he is lifted and then

Where Have You Been?

Truck Driver—"Under the truck body trying to fix the hoist."

Truck Owner—"What! Haven't you delivered that rush order yet?"

Truck Driver—"No. And it will take all day to fix that hoist we have."

Ordinary hoists cannot be depended upon. The worst of it is that they often fail when they are needed the most.

Van Dorn *Mechanical* Hoists are different. They do not leak or clog like ordinary hoists and they can't freeze up in winter because oil is used for lubrication only, not for operation. They are *gear-driven* just like your truck transmission.

Send for catalog fully explaining the reason why Van Dorn *Mechanical* Dump Truck Hoists are better!

THE VAN DORN IRON WORKS CO., Cleveland, Ohio.

Branches and Service Stations in Principal Cities

Van Dorn Gear-Driven Hoists

The Van Dorn "Average Duty" Underbody Hoist. For pay loads up to 7½ tons. $415 complete; a *low* price for a *high* quality hoist.

The Van Dorn "Heavy Duty" Underbody Hoist. For pay loads of 9 tons. Powerful in action, yet easy to control. $585 complete.

Van Dorn

MECHANICAL DUMP TRUCK HOISTS & BODIES

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

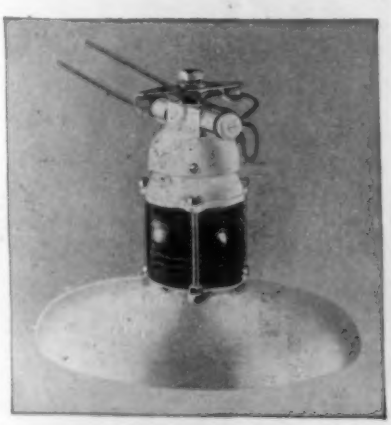
RESCUING A LAD FROM DROWNING IN A SKATING-POND

swung out to a point of safety. This is a device which it is well to have on any skating-pond where the water is more than 3 feet deep, and should be installed by the city playground department or an interested civic organization.

A Double-Duty Traffic Signal Lantern

A new light-weight double-duty traffic signal lantern known as "Young Sol" has been placed on the market by The Nichols-Lintern Company, 7960 Lorain Avenue, Cleveland, Ohio. The particular feature of this lantern is that it gives a long-vision warning from the upper portion of the lantern, while the lower portion gives a brilliant ground illumination at such points as street intersections, railway crossings, interurban car stops, bad curves, bridge abutments and other similar points where both warning lights and ground illumination are essential.

The 4¾-inch Corning Fresnel lens which gives the long-distance warning is made either in ruby, green, yellow or clear glass. The highly polished aluminum reflector, which is 16 inches in diameter, furnishes the ground illumination, one electric light bulb supplying the light for both the lens and the reflector. Equipped with a Mogul base receptacle and an Edison base adapter, it is suitable for a 100-, 200-, 300- or 500-watt lamp. The complete unit is only 13¼ inches high and the cast aluminum construction assures a long life with freedom from rust, dents and acid corrosion. The lantern is furnished with a span wire hanger or for ¾-inch pipe suspension.



A COMBINED WARNING SIGNAL AND FLOOD LIGHT

An Electric Siren for Traffic Control

Present-day traffic conditions demand a dependable siren at busy street intersections if fire apparatus is to pass with safety. The clear tone of a siren means "Fire trucks coming," and there is no other road signal made which secures road clearance and eliminates danger of traffic accidents as quickly.

The Sterling electric traffic siren made by the Inter-State Machine Products Company, Inc., 53 Allen Street, Rochester, N. Y., is claimed to be positively weather-proof and can be installed very quickly. This Type "F" siren is operated by a ⅛-h.p. motor, the bearings of which are lubricated by two accessible oil cups. The motor is enclosed in a substantial housing fitted with a con-

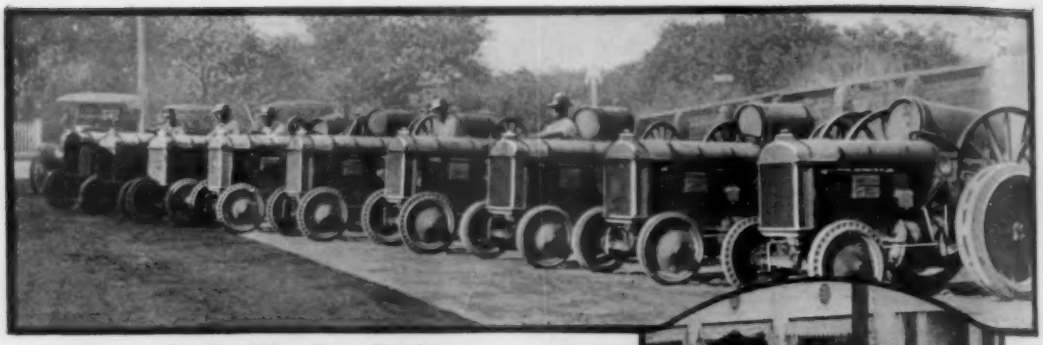
A SIREN TO WARN TRAFFIC

dulet connection so that all wiring may be done in the most approved manner, leaving no exposed wires.

The Sterling siren can be operated from an ordinary snap switch, as the running load is only 2½ amperes on a 110-volt circuit, or it can be controlled from fire headquarters or any firehouse by use of a siren control box and relay. The box will operate the siren automatically for a period of three minutes at intervals of three seconds on and three seconds off, giving traffic plenty of time to make way for the approaching fire apparatus. The siren measures 9 x 14 inches, weighs 14 pounds and is finished in heavy red enamel.

Heed, Vice-President of Garford

The Garford Motor Truck Company, Lima, Ohio, has announced the appointment of Rushmore B. Heed as Vice-President in charge of sales. Mr. Heed has been active in the motor truck industry since 1916, when he left the automobile insurance field to join the sales force of the Diamond T. Mr. Heed's headquarters will be at the Garford factory in Lima.



Municipal Use—Street Cleaning

Ford Products For Every Business

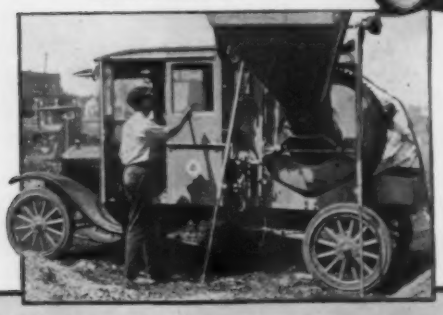
Ford Transportation—Passenger Car and Truck—and Fordson Power can be applied to your business at a substantial saving in time, labor, money.

Your nearest Authorized Ford dealer has up-to-date facts and figures on the cost of operating these dependable units in your business. He will gladly show them to you and at the same time arrange to give you a practical demonstration, any time, any place you name.

House to house delivery

Heavy Hauling

Construction Work



Ford

CARS - TRUCKS - TRACTORS

Advertising as well as quick service

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

THREE VIEWS OF THE COMBINED FLUSHER, SPRINKLER AND ROAD OILER

A Combination Auto Street Flusher, Sprinkler and Road Oiler

The latest development in pressure distributors for municipal street departments is the Kinney combination auto street flusher, sprinkler and road oiler made by the Kinney Manufacturing Company, Boston, Mass. The flusher and sprinkler has a single power-plant for both truck and pump drive. This power is amply sufficient for all requirements when flushing under any pressure. It eliminates the necessity for an extra gasoline engine or other separate power unit for supplying pressure, and only one man is required for driving the truck and for flushing and sprinkling.

The pressure is constant and continuous throughout the discharge of the entire load of water and may be instantly varied to any angle as required by the operator. The tank may be filled from stand-pipes or hydrants. Since the pressure is produced entirely by the pump, there is no pressure in the tank and no compressed air is used, the water being pumped direct to the nozzles in any desired volume.

The Kinney flusher and sprinkler may be equipped with Kinney oil-spraying attachments, which are located at the rear end of the chassis and are used for spraying the lighter grades of road oil or tar products in an atomized spray of required volume and pressure. The change from water sprinkling or flushing to oil spraying is made instantaneously by simply turning a valve without the removal of any attachments. The oil-spraying attachments are controlled from the operator's seat at the rear of the tank or from the driver's seat. This oil-spraying equipment is designed only to handle the light grades of bituminous materials which do not require heating. The equipment is self-loading from tank cars or storage tanks.

A Safety Climbing Tree for Playgrounds

All children like to climb, but city children cannot always find a safe apple tree near-by to give vent to this inborn desire. A safety climbing tree is made by The Patterson-Williams Manufacturing Company, 501-507 West San Fernando Street, San Jose, Calif., which keeps youngsters out of unsafe trees and off fences and prevents the tearing of clothes and keeps them clean.

CLIMBING A SAFE TREE

This tree, illustrated above, is especially adapted for school playgrounds, for children of the kindergarten, first and second grades, as it provides splendid amusement and plenty of exercise. The children use it in a hundred different ways with perfect safety. It is built up of ¾ x 42-inch galvanized pipe with protecting guard-rails at the end to prevent injury. The cross-pipes are welded into 2-inch galvanized pipe standards 7 feet high.

A "V" Type Snow-Plow for Motor Trucks

The Baker "V" type snow-plow for motor trucks is a two-way plow designed for attachment to standard heavy-duty trucks. The attachment is made to the front axle of the truck in the same manner as the Baker auto truck snow-plow, also made by the Baker Manufacturing Company, 503 Sanford Avenue, Springfield, Ill. This snow-

KEEP ROADS UP AND TAXES DOWN

DOWFLAKE

CALCIUM CHLORIDE

Read The Index

A Book for Road Men "How to Maintain Roads"

New and enlarged edition.

This pocket-size volume is chock full of valuable data and information no road man can afford to miss. It tells the latest methods being used by your fellow road builders, with complete information on what they do and how they do it, with quantities of materials to use, and tables, charts and diagrams which show the results of road building and maintenance experience over a period of years and under widely varying conditions. It is really a tribute to the thought, energy and skill of road men throughout the country for it is their work which has made this book possible. It treats of every day problems a road man encounters and is really a summary of accepted methods practiced by the foremost engineers and maintenance men. It's your own book—send for it today and see what your fellow-workers are doing.

This Is Only a Part of the Contents of This Book—It Will Give You an Idea of Its Wide Scope

Application Quantity Table 26
Breaker for Concrete Pavements 69
Cable Guard Rail 51
Care of Play Grounds 21
Cemetery Association, Ohio—Minutes of Meeting 33
Cemetery Drives 33
Condition of Surface When Applying Dowflake 19
Cost of Dust Prevention 21
Destructive Effect of Grinding Action of Wheels 11
Directional Road Signs 51
Distance That Can Be Dust Proofed in a Day 21
Ditches and Culverts 49
Dowflake—What It Is and What It Does 15
Dowflake to Supply and Retain Moisture 17
Drags, Road 54
Drainage 47
Drives on Private Grounds 30
Dust as a Cause of Accident 45
Dust as a Destroyer of Foods 45
Dust as a Disease Carrier 45
Dust Control 15
Dust Control a Maintenance Factor 16
Dust Prevention in Front of Homes 29
Dust Prevention on Small Areas 29
Effect of Moisture in Maintenance 10
Effect of Motor Traffic 43
Equipment for Applying Dust Control Material 30
Grading Machinery 55
Guard Rails 50
Handy Dust Prevention Containers 17
Highway Department Organization 61
Home Made Machinery 67
How Dowflake Supplies Moisture 18
How Much Dowflake to Apply 23
How Road Surfaces are Destroyed 42
How to Prevent Waste of Surface Material 42
How to Secure Blue Prints of Home Made Machinery 31
How to Use Labor 63
Maintenance Machinery 54
Moisture Binding to Prevent Wear 11
Moisture Controls Dust 16
Moist Surfaces Can be Dragged Any Time 18
Moist Surfaces Smooth and Firm 18
Organization Chart 65
Organization of Highway Work 61
Patching Concrete Pavements 69
Patching Gravel Roads 69
Pavement Breaker 71
Plans for Spreading Machine 51
Protective Signs and Markings 50
Public Parks 23
Quantity of Dust Control Material to Use 8
Road Construction Fundamentals 67
Road Machinery (Home Made) 16
Road Maintenance by Dust Prevention 8
Road Maintenance—Reasons for 69
Scarifying 54
Shoulders 53
Sign Maintenance 51
Signs and Road Markings 38
Specifications for Dust Prevention Material 70
Spreaders for Dowflake 11
Surface Protection Against Throwing of Wheels 67
Surface Scarifier 33
Tennis Court—Construction and Upkeep 63
Traffic Count Affects Road Wear 63

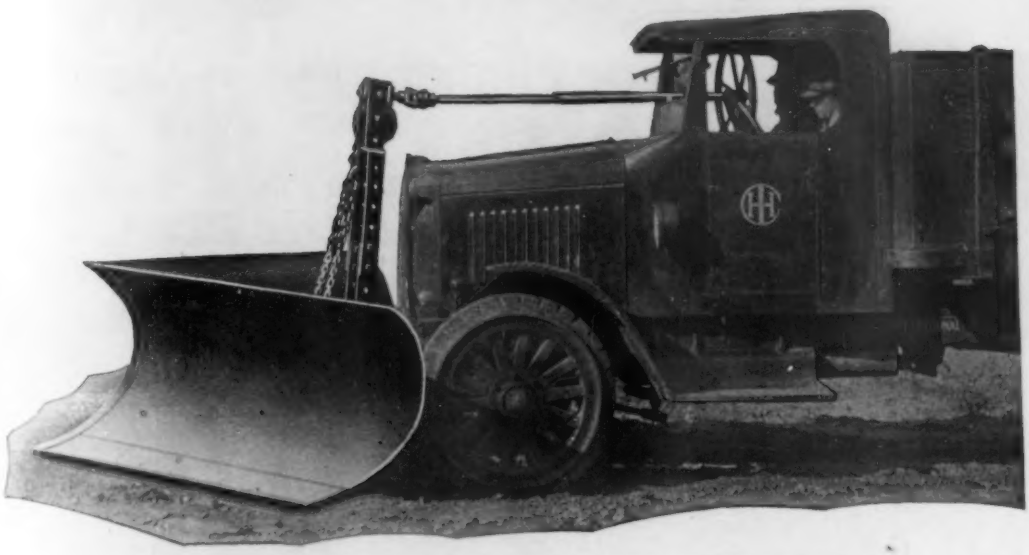
The Dow Chemical Company

Midland, Michigan

BRANCH SALES OFFICES

90 West Street
New York City

Second & Madison Sts.
Saint Louis



AN EFFECTIVE COMBINATION FOR REMOVING SNOW-DRIFTS FROM ROADS

plow is made to meet the demand for a practical two-way plow for use with motor trucks to suit special conditions where there is no objection to throwing the snow out both to the left and to the right.

This plow is made a standard width of 8 feet. This represents the width of roadway the plow will open in one trip. By using one side of the plow only, it is possible to move the snow a distance of 3 or 4 feet on each side, making a total width moved of 14 to 16 feet, which is sufficient to take care of ordinary traffic. The plow is braced in such a way that the moldboard or wings will withstand any pressure that the average motor truck can apply in snow removal work. The curvature of the wings is designed to offer the least possible resistance to the movement of snow in its average state.

One of the particular advantages of the "V" type snow-plow over other types is the elimination of side draft in moving the snow. This very naturally gives an opportunity for the motor truck to use its full power in moving very deep snow. The method used in moving snow with the "V" type plow differs from that of the blade type plow because the latter is reversible to move snow to either side. One method of opening up a wide road or street for prompt use by motor traffic is to clean one side of the road and then the other, leaving an accumulation of snow in the center of the road. This permits the use of two paths each 8 feet wide for travel in each direction. This assumes, however, that the road or street is of sufficient width to permit this method to be used. It is possible, however, to widen out the path made by the plow several feet wider by using one side of the plow.

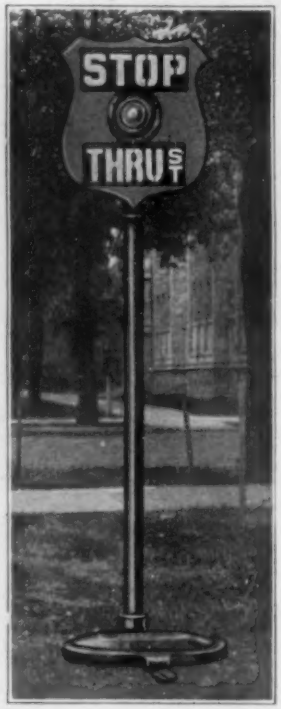
The Baker "V" type plow can be attached without extras to any standard make of motor truck without drilling any holes in any part of the truck frame. This is of decided advantage when it is necessary to attach the snow-plow to another truck when the truck on the snow-plow is disabled. This would be impossible if a special frame was made for each truck, as the frame would be useless on another make of truck. There are certain trucks of unusual front end construction and certain four-wheel drive trucks for which it is necessary to construct a special attachment.

Universal axle clamps, after being placed on the motor trucks, may be left on all winter so as to be ready for attaching the snow-plow when a storm arrives. They do not interfere in any way with the operation of the trucks and it saves valuable time to keep them on at all times. It is a comparatively simple matter to attach the A-frame of the plow with only two bolts when necessary, and takes but a few moments.

Improvements in Spokane Water-Works

IMPROVEMENTS for the city water system of Spokane, Wash., to be built during 1925, total more than $460,000, according to the budget compiled by Superintendent A. Lindsay and forwarded to the city auditor. Two of the group items are new cast-iron mains to replace some wooden mains in use on the north side of the city at a cost of $175,000, and new electric pumps to be housed in an addition to the pumping plant and one new well, at a combined cost of $165,000. Fifty million gallons will be added to the daily pumping capacity of the water-works by the proposed unit as compared with 86,000,000 gallons per day capacity at present. The third large item is the building of a new reservoir east of the city at a cost of $120,000.

This is the largest program of water-works improvements proposed to be undertaken in Spokane since 1909. The improvements will be financed from the funds of the Water Department, which is self-supporting, and will not be reflected in the tax levy.



for efficiency — —the

ADLAKE

Electric

FLASHING HIGHWAY SIGNAL

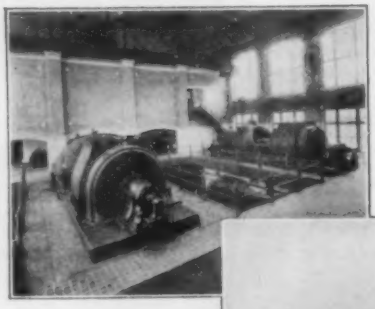
The efficient signal must function one hundred per cent day and night. It must operate economically. It requires minimum attention. The ADLAKE fills the bill in every particular.

At night the steady, insistent flash of the ADLAKE'S large red lens and the illuminated opalescent lettering cannot be overlooked by the approaching motorist. And in the day time the white letters against a black background are readable for almost a city block. The ADLAKE operates from primary batteries for more than a year without attention.

Write for complete particulars and descriptions of various types.

The Adams & Westlake Co.

New York CHICAGO Philadelphia



WIRED WITH SIMPLEX

Penn. Central Power Co.
Saxton Substation

Day & Zimmermann, Inc., Engrs.

Simplex Wires and Cables are rendering satisfactory service in many of the larger power stations of the country. Insulated with rubber, paper or varnished cambric and covered with braid, lead or steel armor, they are made for the particular conditions under which they are installed.

Why not submit your specifications to us?

SIMPLEX WIRE & CABLE CO.
Manufacturers
201 Devonshire St. Boston

Chicago
San Francisco
New York

Factory and Main Office at Boston